

Murray M. Sinclair (SBN 150389)  
murray@murraysinclairlaw.com  
MURRAY M. SINCLAIR & ASSOCIATES  
1880 Century Park East, Suite 511  
Los Angeles, CA 90067  
Telephone: (310) 826-2700  
Facsimile: (310) 826-2727

Attorneys for Third-Party Defendant  
Saugus Industrial Center, LLC

NOSSAMAN LLP  
FREDERIC A. FUDACZ (SBN 50546)  
ffudacz@nossaman.com  
BYRON GEE (SBN 190919)  
bgee@nossaman.com  
PATRICK J. RICHARD (SBN 131046)  
prichard@nossaman.com  
TARA E. PAUL (SBN 305366)  
tpaul@nossaman.com  
777 S. Figueroa Street, 34th Floor  
Los Angeles, CA 90017  
Telephone: 213.612.7800  
Facsimile: 213.612.7801

Attorneys for Plaintiff SANTA CLARITA VALLEY  
WATER AGENCY

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

SANTA CLARITA VALLEY WATER  
AGENCY,

Plaintiff,

vs.

WHITTAKER CORPORATION and  
DOES 1-10, Inclusive,

Defendant.

Case No: 2:18-cv-06825 SB (RAOx)

**NOTICE OF LODGING OF  
DEPOSITION TRANSCRIPT OF  
GARY HOKKANEN IN SUPPORT  
OF JOINT MOTION FOR  
SETTLEMENT APPROVAL,  
CLAIM BAR AND GOOD FAITH  
DETERMINATION OF SAUGUS  
INDUSTRIAL AND SANTA  
CLARITA VALLEY WATER  
AGENCY**

Date: November 6, 2020  
Time: 10:30 a.m.  
Courtroom: 6C

Date Action Filed: August 8, 2018  
Trial Date: January 19, 2021

AND RELATED CASES

1 TO THE COURT, ALL PARTIES AND THEIR ATTORNEYS OF  
2 RECORD:

3 PLEASE TAKE NOTICE that moving parties herein, Third-Party Defendant  
4 SAUGUS INDUSTRIAL CENTER, LLC (“Saugus” or “SIC”) and Plaintiff  
5 SANTA CLARITA VALLEY WATER AGENCY (“SCVWA”), in connection  
6 with their Joint Motion for Settlement Approval, Claim Bar and Good Faith  
7 Determination, hereby lodge a certified copy of the Deposition transcript of Gary  
8 Hokkanen, an expert designated by Defendant and Third-Party Plaintiff Whittaker  
9 Corporation, which was taken in this matter on September 29, 2020. A true and  
10 correct copy of said transcript is attached hereto as **Exhibit 1**.

11  
12 Date: October 14, 2020

MURRAY M. SINCLAIR &  
ASSOCIATES

14 By: /s/ Murray M. Sinclair  
15 Murray M. Sinclair

16 Attorneys For Third-Party Defendant  
17 SAUGUS INDUSTRIAL CENTER,  
LLC

18  
19 Date: October 14, 2020

NOSSAMAN LLP  
FREDERIC A. FUDACZ  
BYRON GEE  
PATRICK J. RICHARD  
TARA E. PAUL

23 By: /s/ Patrick J. Richard  
24 Patrick J. Richard

25 Attorneys for Plaintiff SANTA  
26 CLARITA VALLEY WATER  
27 AGENCY  
28

# **EXHIBIT 1**

1 UNITED STATES DISTRICT COURT  
2 CENTRAL DISTRICT OF CALIFORNIA  
3  
4

5 SANTA CLARITA VALLEY WATER )  
6 AGENCY, ) No. 2:18-CV-6825-  
7 Plaintiff, ) GW(RAOx)  
8 VS. )  
9 WHITTAKER CORPORATION, et al.)  
10 Defendant. )  
11 \_\_\_\_\_ )  
12 AND RELATED CROSS-ACTION. )  
13 \_\_\_\_\_ )  
14  
15

16 VIDEOTAPED ZOOM/TELEPHONIC DEPOSITION OF:

17 GARY HOKKANEN

18 TUESDAY, SEPTEMBER 29, 2020

19 9:38 A.M.  
20  
21

22 Reported by: LINDA NICKERSON

23 CSR No. 8746

24 Job No. 4266459

25 Pages 1-329

Page 1

Gary Hokkanen

1 Videotaped deposition of GARY HOKKANEN, the  
2 witness, taken on behalf of the Plaintiff, on  
3 TUESDAY, SEPTEMBER 29, 2020, 9:38 a.m., utilizing  
4 Zoom Remote Technology, Oakland, California, before  
5 LINDA NICKERSON, CSR No. 8746, pursuant to NOTICE.

6  
7 APPEARANCES OF COUNSEL:

8 FOR PLAINTIFF:

9 NOSSAMAN, LLP

10 BY: BYRON P. GEE, ESQ.

11 777 South Figueroa Street

12 Thirty-Fourth Floor

13 Los Angeles, California 90017-1602

14 (213) 612-7800

15 bgee@nossaman.com  
16

17 FOR THIRD-PARTY DEFENDANT SAUGUS INDUSTRIAL CENTER,  
18 LLC:

19 MURRAY M. SINCLAIR & ASSOCIATES

20 BY: MURRAY M. SINCLAIR, ESQ.

21 1880 Century Park East

22 Suite 511

23 Los Angeles, California 90067-1607

24 (310) 826-2700

25 murray@murraysinclairlaw.com

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Gary Hokkanen

1 APPEARANCES OF COUNSEL (Continued):

2  
3 FOR DEFENDANT AND THIRD-PARTY PLAINTIFF WHITTAKER  
4 CORPORATION:

5 BASSI, EDLIN, HUIE & BLUM, LLP

6 BY: EARL L. HAGSTROM, ESQ.

7 DANIEL E. TROWBRIDGE, ESQ

8 500 Washington Street

9 Suite 700

10 San Francisco, California 94111

11 (415) 397-9006

12 ehagstrom@behblaw.com

13 dtrowbridge@behblaw.com

14  
15 ALSO PRESENT:

16 LORI TALBOTT (Videographer)

17  
18  
19  
20  
21  
22  
23  
24  
25  
  
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#8724  
Gary Hokkanen

## I N D E X

WITNESS	EXAMINATION	PAGE
GARY HOKKANEN		
	By Mr. Gee	7, 306
	By Mr. Sinclair	249

## E X H I B I T S

NUMBER	PAGE	DESCRIPTION
Exhibit 314	12	Expert Report of Gary Hokkanen
Exhibit 315	19	EKI Invoices
Exhibit 316	119	Potentiometer Surface Map by AECOM
Exhibit 317	128	Distribution of TCE and Perchlorate in Saugus Formation
Exhibit 318	138	Potentiometer Surface Map by AECOM
Exhibit 319	180	2019 Homogenous Model
Exhibit 320	250	Rebuttal to Expert Report of Dr. Robert M. Gailey

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## E X H I B I T S (Continued)

NUMBER	PAGE	DESCRIPTION
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Exhibit 321	273	Simulated Hydraulic Containment of Pumping Saugus Production Wells
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## EXHIBITS PREVIOUSLY MARKED

NUMBER	PAGE
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Exhibit 11	151
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## UANSWERED QUESTIONS

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17	12
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17	19
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17	23
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1 TUESDAY, SEPTEMBER 29, 2020; 9:38 A.M.

2 09:16:11

3 THE VIDEOGRAPHER: We are going on the 09:38:26

4 record at 9:38 a.m. on September 29, 2020. 09:38:28

5 This deposition is being conducted using 09:38:33

6 Veritext Virtual Technology, and all participants 09:38:35

7 are attending remotely. Audio and video recording 09:38:38

8 will continue to take place unless all parties agree 09:38:42

9 to go off the record. 09:38:45

10 This is Media Unit One of the 09:38:46

11 video-recorded deposition of Gary Hokkanen taken by 09:38:48

12 counsel for plaintiff in the matter of Santa Clarita 09:38:52

13 Valley Water Agency versus Whittaker Corporation, et 09:38:55

14 al., filed in the United States District Court, 09:39:01

15 Central District of California, Case Number 09:39:02

16 2:18-CV-6825 GW. 09:39:08

17 My name is Lori Talbott from the firm 09:39:10

18 Veritext. I'm the videographer. The court reporter 09:39:13

19 is Linda Nickerson from the firm Veritext. 09:39:15

20 I am not related to any party in this 09:39:18

21 action nor am I financially interested in the 09:39:20

22 outcome. 09:39:22

23 If there are any objections to proceeding, 09:39:23

24 please state them at the time of the appearance, and 09:39:27

25 we'll begin with the noticing attorney, please. 09:39:29

1 MR. GEE: Byron Gee for Plaintiff Santa 09:39:31  
2 Clarita Valley Water Agency. 09:39:37  
3 MR. SINCLAIR: Murray Sinclair for 09:39:40  
4 Third-Party Defendant Saugus Industrial Center, LLC. 09:39:42  
5 MR. HAGSTROM: Earl Hagstrom for Whittaker 09:39:46  
6 Corporation and defense attorney for the witness, 09:39:49  
7 Mr. Hokkanen. 09:39:52  
8 THE VIDEOGRAPHER: Thank you. Would the 09:39:55  
9 court reporter please swear in the witness. 09:39:56  
10  
11 GARY HOKKANEN,  
12 having been first duly sworn, was  
13 examined and testified as follows: 09:40:07  
14 09:40:07  
15 EXAMINATION  
16 BY MR. GEE: 09:40:12  
17 Q Mr. Hokkanen, can you state and spell your 09:40:12  
18 name for the record. 09:40:14  
19 A Gary Hokkanen, G-a-r-y, H-o-k-k-a-n-e-n. 09:40:17  
20 Q Mr. Hokkanen, looking at your resume, 09:40:25  
21 you've given a lot of depositions, but -- is that 09:40:28  
22 correct? 09:40:32  
23 A Yes. 09:40:32  
24 Q But I'll just briefly go over the normal 09:40:32  
25 admonitions just because we need to make a record of 09:40:38

1 it. 09:40:41

2 You were just sworn in by the court 09:40:44

3 reporter and do you understand that, as a deposition 09:40:46

4 witness, that you're testifying under oath as if you 09:40:48

5 were at -- at trial? 09:40:51

6 A Yes. 09:40:52

7 Q And that the deposition is being videotaped 09:40:53

8 as well as being recorded. 09:40:59

9 So the court reporter is going to be making 09:41:04

10 a transcript of everything that I say, everything 09:41:06

11 you say, everything your counsel says, everything 09:41:09

12 that Mr. Sinclair says. So we have to make all of 09:41:12

13 our responses audible. So we can't use words -- 09:41:16

14 shouldn't be using words like uh-huh or huh-uh, nods 09:41:21

15 -- head nods? 09:41:26

16 Will you agree to provide audible responses 09:41:27

17 to any questions that are being asked of you? 09:41:29

18 A Yes. 09:41:32

19 Q And before we get started, you know, we're 09:41:33

20 dealing with some pretty technical material. 09:41:43

21 Sometimes my questions may not be as clear as I 09:41:45

22 would hope that they would be. 09:41:48

23 If my questions are ambiguous or you don't 09:41:49

24 understand it, will you agree to ask me to restate 09:41:52

25 the question before answering? 09:41:56

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Page 10

1 Q Okay. Anything else? 09:45:08

2 A I was also asked to look at a -- the claim 09:45:09

3 of the bona fide prospective purchaser that SIC has 09:45:14

4 made, and I rendered an opinion about that. 09:45:20

5 Q Okay. Who's your primary contact with 09:45:22

6 Whittaker? 09:45:26

7 A From Bassi Edlin? 09:45:26

8 Q If it's from Bassi Edlin, yes. 09:45:33

9 A Fred Blum and Earl Hagstrom. 09:45:35

10 Q Okay. And how many times have you talked 09:45:38

11 to Mr. Blum since you've been retained 09:45:40

12 approximately? 09:45:42

13 A I'm sorry. I haven't counted. Quite a few 09:45:43

14 times. 09:45:50

15 Q And at any time, has Mr. Blum gave you 09:45:50

16 guidance as to what your opinions should be? 09:45:55

17 A No. 09:45:58

18 Q And how often have you talked to 09:46:00

19 Mr. Hagstrom? 09:46:05

20 A Again, I'm not sure. Quite a few times 09:46:05

21 during this process. 09:46:08

22 MR. GEE: On page 10 of your -- let me 09:46:20

23 introduce your report. 09:46:22

24 Okay. For the record, I believe we're on 09:47:12

25 Exhibit 314? 09:47:15

1 THE REPORTER: Correct. 09:47:15

2 MR. GEE: And Exhibit 314 is a copy of 09:47:16

3 Mr. Hokkanen's expert report. It may take a little 09:47:19

4 bit of time to load. 09:47:23

5 MR. SINCLAIR: I still have not received 09:47:26

6 the exhibits. 09:47:28

7 MR. GEE: From -- check in like -- check in 09:47:33

8 your marked exhibit folder, Murray. It should be 09:47:38

9 coming up. 09:47:43

10 MR. SINCLAIR: It's not -- you know what, I 09:48:21

11 don't want to hold up the deposition. I'll call 09:48:22

12 Aileen off-line. 09:48:27

13 MR. GEE: If -- if you refresh your folder, 09:48:34

14 you may actually see -- see an exhibit folder for 09:48:35

15 you, but if not, then go off line and talk to 09:48:40

16 Aileen.

17 (The document referred to was marked by the

18 Reporter as Deposition Exhibit 314 for

19 identification and is attached hereto.)

20 BY MR. GEE: 09:48:48

21 Q Mr. Hokkanen, on page 10 your report, you 09:48:48

22 site to a 2015 VOC investigation by CH2M Hill; is 09:48:50

23 that correct? 09:48:59

24 A This is my marked page 10 or page 10 of 09:49:02

25 the -- 09:49:10

1 Q I think the way I drafted the question, 09:49:10  
2 it's page 10 of a -- of your report. 09:49:11  
3 A I'm not seeing that page. Let's see. I'm 09:49:27  
4 sorry. I see it on page 11. 09:49:41  
5 Q On page 11. You're on page 11. I just 09:49:42  
6 want to make sure that you're aware of the record. 09:49:45  
7 Are you aware of any study that refutes the 09:49:50  
8 findings of this report? 09:49:53  
9 A What findings specifically are you 09:49:55  
10 referring to? 09:49:58  
11 Q Well, any of the findings. 09:49:59  
12 MR. HAGSTROM: That's too broad and vague. 09:50:03  
13 THE WITNESS: I'm not sure what findings 09:50:05  
14 you're referring to. There are -- there are 09:50:10  
15 opinions in this report. There are -- there's data 09:50:14  
16 from other reports. I'm not sure exactly what 09:50:17  
17 you're referring to. 09:50:20  
18 BY MR. GEE: 09:50:31  
19 Q My question is: Are you aware of any study 09:50:31  
20 that refutes this report? Are you aware of any 09:50:33  
21 studies that were performed that -- that refute the 09:50:36  
22 report, that directly -- 09:50:41  
23 MR. HAGSTROM: Objection; vague. 09:50:43  
24 BY MR. GEE:  
25 Q -- refute the report? 09:50:44



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1 long time ago. It was shortly after his deposition. 09:52:02

2 I don't recall specifically that he said that. 09:52:04

3 Q Okay. Was one of your assignments to rebut 09:52:07

4 the 2015 VOC investigation report? 09:52:11

5 A Not specifically, no. 09:52:14

6 Q Mr. Hokkanen, are you familiar with the 09:52:17

7 consulting firm AECOM, A-E-C-O-M? 09:52:23

8 A Yes, very, yes, I am. 09:52:28

9 Q Okay. And is AECOM generally considered to 09:52:30

10 be a reputable consulting firm? 09:52:35

11 A I don't really have an opinion about that 09:52:37

12 to tell you the truth, but I think so. 09:52:41

13 Q Okay. 09:52:43

14 A I've never really worked directly with 09:52:44

15 them. So I'm not sure. 09:52:47

16 Q Okay. Have you ever heard anything 09:52:48

17 negative about them from your peers in the business? 09:52:52

18 A I haven't heard anything positive or 09:52:57

19 negative, but I honestly don't really have an 09:52:59

20 opinion. I know of the firm. I've seen their 09:53:02

21 reports over the years. 09:53:04

22 Q Okay. And based on your review of the 09:53:07

23 reports, have you ever recommended to Whittaker that 09:53:10

24 they should question the quality of AECOM's reports? 09:53:15

25 A Have I done that? 09:53:18

1 Q Yes. 09:53:21

2 A That really wasn't part of what I was asked 09:53:21

3 to do. 09:53:25

4 Q My question is that even if it weren't part 09:53:26

5 of what you were asked to do, have you ever made 09:53:29

6 that recommendation to Whittaker? 09:53:31

7 A I don't believe I have, no. 09:53:34

8 Q Mr. Hokkanen, in addition to being an 09:53:35

9 expert witness, you also consult with clients. 09:53:45

10 Is that a correct characterization of your 09:53:48

11 background, you provide environmental consulting? 09:53:51

12 A Yes. 09:53:54

13 Q As a consultant, have you ever produced a 09:53:55

14 report that -- knowing that it had wrong information 09:54:00

15 in it? 09:54:04

16 A Knowingly, no. 09:54:07

17 Q Knowingly. Do you think that AECOM would 09:54:08

18 follow that same standard? 09:54:20

19 MR. HAGSTROM: Calls for speculation. 09:54:23

20 THE WITNESS: I don't really know anyone at 09:54:28

21 AECOM. So I can't really answer that one. 09:54:29

22 BY MR. GEE: 09:54:31

23 Q Okay. Do you know of any consulting firm 09:54:31

24 that would intentionally misrepresent information? 09:54:33

25 MR. HAGSTROM: Vague, overbroad. 09:54:41

1 THE WITNESS: I will tell you in my 09:54:42  
2 40 years working in this field, I've heard of it a 09:54:49  
3 few times, but it's not common. 09:54:52  
4 BY MR. GEE: 09:54:53  
5 Q Okay. Have you ever heard of that from 09:54:53  
6 anybody saying that about AECOM? 09:54:56  
7 A I have not heard that, no, sir. 09:54:58  
8 Q Mr. Hokkanen, did you attend a mediation 09:55:05  
9 session with the Honorable Carl West around 09:55:07  
10 July 24th, 2019? 09:55:11  
11 A Yes. 09:55:14  
12 Q And did you render an opinion at the time 09:55:15  
13 as to the source of VOC contamination of plaintiff's 09:55:17  
14 wells? 09:55:24  
15 MR. HAGSTROM: I'm sorry. That's covered 09:55:24  
16 by the mediation privilege. He should not answer 09:55:25  
17 that question. 09:55:28  
18 BY MR. GEE: 09:55:39  
19 Q Did you have an opinion at that time -- 09:55:39  
20 MR. HAGSTROM: Same objections. Do not 09:55:42  
21 answer that question. 09:55:44  
22 BY MR. GEE: 09:55:54  
23 Q Did you have any opinions at that time, 09:55:54  
24 sir? 09:55:56  
25 MR. HAGSTROM: Do not answer that question. 09:55:59

1 MR. GEE: Mr. Hagstrom, are you asserting a 09:56:10  
2 privilege? 09:56:12  
3 MR. HAGSTROM: Yes, I am. 09:56:12  
4 MR. GEE: And what type of privilege are 09:56:14  
5 you asserting? 09:56:15  
6 MR. HAGSTROM: It's the mediation privilege 09:56:16  
7 that we all signed and agreed to when we entered 09:56:17  
8 into that meeting. 09:56:21  
9 MR. GEE: I may come back to that. 09:56:36  
10 MR. HAGSTROM: Okay. 09:56:37  
11 MR. GEE: Mediation privilege is fairly 09:56:51  
12 limited. 09:56:53  
13 MR. HAGSTROM: We can go back to the judge, 09:56:54  
14 but he's not going to answer these questions. 09:56:56  
15 MR. GEE: You're not going to let him 09:57:15  
16 answer a question as to whether he had an opinion? 09:57:16  
17 MR. HAGSTROM: I believe that mediation is 09:57:20  
18 covered by the mediation privilege. I'd be happy to 09:57:22  
19 take it up with Judge Wu, if you want, at another 09:57:25  
20 time. 09:57:28  
21 MR. GEE: Mr. Hokkanen, I just introduced 09:57:51  
22 Exhibit 315. You may have to refresh your screen in 09:57:55  
23 order for the exhibit to show up. 09:58:02  
24 THE WITNESS: I see it. 09:58:04  
25 (The document referred to was marked by the

1 Reporter as Deposition Exhibit 315 for  
2 identification and is attached hereto.)

3 BY MR. GEE: 09:58:09

4 Q In taking a look at your -- and for the 09:58:09  
5 record, Exhibit 315 is the invoices from ETI related 09:58:12  
6 to this matter. 09:58:20

7 In totaling up your bills through at least 09:58:24  
8 August 21st, which is the last time entry that I saw 09:58:30  
9 in the report, the -- your fees came up to a little 09:58:33  
10 more than 440,000. 09:58:40

11 Is that about -- does that sound about 09:58:43  
12 right? 09:58:44

13 A I haven't really added it up, but it's 09:58:45  
14 probably about that, yes. 09:58:48

15 Q And since August 21st, which, you know, as 09:58:49  
16 I say, is the last time entry I saw on the -- on the 09:58:56  
17 report, have you done more work for -- for Whittaker 09:58:58  
18 on -- on this matter? 09:59:02

19 A Since August of this year? 09:59:04

20 Q Yes, since August 21st of this year. 09:59:06

21 A Yes. 09:59:09

22 Q And do you know how much -- how much it is 09:59:10  
23 approximately? I'm not looking for an exact number, 09:59:15  
24 but is it a little, a lot since -- since 09:59:18  
25 August 21st? 09:59:24

1           A     I'm not sure. I'll know when the invoices     09:59:25  
2     come. So I'm not sure.     09:59:32  
3           Q     Okay. And generally when do you -- when do     09:59:33  
4     you generate invoices? Is it -- is it at the end of     09:59:36  
5     every month?     09:59:40  
6           A     Yes, yes, and then they go out sometime     09:59:42  
7     after the first of the next month.     09:59:44  
8           Q     Do you know if you provided Whittaker with     09:59:49  
9     invoice -- with an invoice after August 21st?     09:59:51  
10          A     I don't believe so, no.     09:59:55  
11          Q     Based on your report, I presume that you     09:59:56  
12     looked at a significant -- significant amount of     10:00:12  
13     groundwater monitoring data; is that correct?     10:00:16  
14          A     Yes.     10:00:18  
15          Q     Now, do you know how many groundwater     10:00:18  
16     monitoring wells have been installed at the     10:00:28  
17     Whittaker-Bermite site approximately?     10:00:30  
18          A     I think I have the number in my expert     10:00:34  
19     report. It's over 200 wells.     10:00:36  
20          Q     Okay. It's 200 wells on the     10:00:41  
21     Whittaker-Bermite site?     10:00:43  
22          A     I believe so. I have the numbers in my     10:00:43  
23     expert report.     10:00:47  
24          Q     Okay. Do you know how many monitoring     10:00:50  
25     reports Whittaker has installed off -- off-site from     10:00:53

1 the Whittaker-Bermite site? 10:00:56

2 A There are a few. The -- there are some 10:00:57

3 off-site wells. Some were installed by Whittaker 10:01:03

4 and some by others. 10:01:06

5 Q Okay. And do you know how many -- 10:01:08

6 approximately how many? 10:01:10

7 A I'm not sure who installed what. There's 10:01:16

8 probably -- off-site, there's probably 20, 30 wells, 10:01:21

9 something like that. 10:01:25

10 Q But it's a significantly lower number than 10:01:27

11 what's on-site; is that -- is that a fair 10:01:33

12 characterization? 10:01:35

13 A There are more on-site than off-site. 10:01:36

14 That's my understanding, yes. 10:01:38

15 Q Let me ask you some general questions as an 10:01:40

16 expert hydrogeologist regarding flow paths. 10:01:58

17 Is it true that groundwater elevation 10:02:05

18 contours are generally used to define flow lines? 10:02:08

19 A They are used to help us understand flow 10:02:17

20 direction, that's correct. 10:02:19

21 Q Okay. And aren't the flow lines indicative 10:02:20

22 of the direction that contaminants in the 10:02:24

23 groundwater would generally migrate? 10:02:27

24 A In a general way, yes. Dissolved 10:02:34

25 contaminants flow with the groundwater, that's 10:02:37



1 correct. 10:02:43

2 Q Okay. Now, do you need contaminant -- or 10:02:43

3 do you need monitoring well data in order to 10:02:49

4 construct a flow path -- groundwater flow path? 10:02:52

5 A Could you repeat that? I just want to make 10:02:59

6 sure I understand your question. 10:03:00

7 Q Do you need groundwater monitoring well 10:03:01

8 contamination data to establish a migration flow 10:03:04

9 path? 10:03:09

10 A Well, migration flow path for dissolved 10:03:09

11 contaminants generally are best determined by where 10:03:15

12 the contaminants are, and so water quality data from 10:03:21

13 monitoring wells can be used to make that 10:03:26

14 determination, yes. 10:03:29

15 Q Just by a groundwater flow path itself, do 10:03:30

16 you need groundwater contamination data? 10:03:37

17 A That's a very good way to do it, yes. 10:03:40

18 Q Now, based on your review, are there a 10:03:45

19 sufficient -- sufficient number of off-site 10:03:56

20 groundwater monitoring wells for hydrogeologists to 10:03:58

21 use groundwater contamination to establish off-site 10:04:02

22 groundwater flow paths? 10:04:05

23 A I'm sorry. That was a very detailed 10:04:06

24 question. Could you repeat that? I apologize. 10:04:13

25 Q All right. Are there sufficient number of 10:04:15

1 off-site groundwater monitoring wells for a 10:04:19  
2 hydrogeologist to use just groundwater contamination 10:04:24  
3 data to establish off-site groundwater flow paths? 10:04:31  
4 A Are there enough -- are there enough data 10:04:37  
5 points? 10:04:39  
6 Q Are there enough -- are there sufficient 10:04:39  
7 number of off-site monitoring wells for a 10:04:41  
8 hydrogeologist to use to establish an off-site 10:04:45  
9 groundwater flow path? 10:04:51  
10 A Well, the first part of the answer is, as a 10:04:52  
11 hydrogeologist, we always want more data, and my job 10:05:02  
12 was to use the data that's available to form my 10:05:06  
13 opinions. 10:05:10  
14 Q Okay. But my question is: Based on the 10:05:10  
15 number of groundwater off-site monitoring wells, can 10:05:21  
16 you use the contamination data in and of itself to 10:05:25  
17 establish off-site groundwater flow paths? 10:05:29  
18 MR. HAGSTROM: Objection. It's compound. 10:05:35  
19 Go ahead, Gary -- or Mr. Hokkanen. 10:05:40  
20 THE WITNESS: Well, in a general way, the 10:05:42  
21 answer is yes, and here's the reason I say that. As 10:05:45  
22 Ms. Stanin talked about, we can use perchlorate as 10:05:53  
23 what she called a tracer. 10:05:59  
24 And what that means is that the presence of 10:06:00  
25 perchlorate will show where contaminants have moved 10:06:03

1 over a long period of time, and the perchlorate area 10:06:10  
2 that's been impacted -- I believe you're talking 10:06:14  
3 about downgradient of the Bermite site -- has been 10:06:17  
4 fairly well characterized. We have a pretty decent 10:06:20  
5 idea of where the contamination is downgradient of 10:06:24  
6 the Bermite site. 10:06:30  
7 BY MR. GEE: 10:06:30  
8 Q Mr. Hokkanen, would you characterize -- or 10:06:30  
9 do you have enough information on perchlorate to 10:06:35  
10 fully characterize the perchlorate plume? 10:06:39  
11 A The perchlorate plume where? 10:06:41  
12 Q Off-site. 10:06:47  
13 A Off-site. In a general sense, yes, it's -- 10:06:47  
14 it's -- it's -- it has been defined by the data, 10:06:53  
15 yes. Are all the boundaries perfectly defined, no. 10:06:55  
16 Q So is it correct to say that the leading 10:07:00  
17 edge of the perchlorate plume has not been defined 10:07:06  
18 yet? 10:07:09  
19 A I think based on my look at the data, 10:07:09  
20 that's been fairly well defined, yes, but the site 10:07:12  
21 boundary is a little bit so, but the downgradient 10:07:15  
22 extent, yes. 10:07:19  
23 Q Okay. So it's your opinion that the 10:07:20  
24 leading edge has been defined of -- leading edge of 10:07:22  
25 the perchlorate plume has been defined? 10:07:25

1 A Fairly well, yes. 10:07:27

2 Q Is there any information -- perchlorate 10:07:29

3 information between well 205 and well V-160? 10:07:38

4 A DW-2 is -- is upgradient of V-160. 10:07:43

5 Q Okay. And what was that, VW-2? 10:07:50

6 A D, as in David, W-2. 10:07:56

7 Q Okay. And does DW-2 have perchlorate 10:08:01

8 contamination? 10:08:04

9 A It has very low part per billion, somewhere 10:08:04

10 between like one in four or five part per billion. 10:08:08

11 That, to me, would indicate that we're very close to 10:08:10

12 the leading edge. V-160, which is then downgradient 10:08:13

13 of DW-2, has not shown perchlorate. 10:08:17

14 Q Okay. How about delineation to the 10:08:21

15 northwest of V-20 -- V-205, has the groundwater 10:08:25

16 perchlorate leading edge been defined in that 10:08:35

17 direction? 10:08:38

18 A Which direction from V-205? Could you say 10:08:38

19 that again? Your -- it's the sound quality. Sorry. 10:08:46

20 Q All right. If you go to the north of 10:08:49

21 V-205, is the groundwater plume -- the leading edge 10:08:53

22 of the groundwater plumb defined in that direction? 10:08:58

23 A There are several wells that are north of 10:09:02

24 V-205, and that data has been used to draw the 10:09:05

25 extent of the perchlorate plume, yes. 10:09:11

1 Q But has the leading edge been defined? 10:09:14

2 A Leading edge appears to be right near the 10:09:17

3 DW-2 and 160 wells. 10:09:21

4 Q And that's to the north of V-205? 10:09:25

5 A That's primarily to the west and northwest. 10:09:28

6 Q Okay. What about to the north, has the 10:09:31

7 leading edge -- has the leading edge of the 10:09:38

8 perchlorate plume been defined north of V-205? 10:09:40

9 A Well, the leading edge, the term you're 10:09:46

10 using, by definition, is the most downgradient edge. 10:09:48

11 And so north of V-205 wouldn't be in the 10:09:52

12 downgradient direction. It's primarily in a -- sort 10:09:57

13 of a cross-gradient direction. The leading edge 10:10:00

14 appears to be in the vicinity of DW-2 and V-160. 10:10:03

15 Q Okay. But the perchlorate plume, as drawn, 10:10:10

16 isn't that -- isn't that a fairly wide plume? Can 10:10:14

17 you just use one or two wells to define the leading 10:10:22

18 edge? 10:10:26

19 MR. HAGSTROM: Object as drawn by whom. 10:10:27

20 BY MR. GEE: 10:10:40

21 Q You can answer, Mr. Hokkanen. 10:10:40

22 A Would you repeat the question, Mr. Gee? 10:10:42

23 I'm sorry. 10:10:44

24 Q Okay. The leading edge of perchlorate is 10:10:44

25 quite broad, is it not? 10:10:49

1           A     The width of the plume is -- in some areas     10:10:53  
2           has been drawn to be about a mile wide.   The leading     10:10:57  
3           edge -- the leading edge, which as I testified,     10:11:01  
4           appears based on the data in the groundwater flow     10:11:05  
5           direction to be in the vicinity of DW-2 and V-160.     10:11:09  
6           Q     Okay. And can you define the leading edge     10:11:13  
7           based on -- of a mile wide plume based on just     10:11:18  
8           two -- two monitoring wells?     10:11:23  
9           A     With more data, that -- that may change,     10:11:24  
10          but based on the existing data, that's -- that's     10:11:28  
11          what it appears to be, yes.     10:11:31  
12          Q     Okay. If I go -- if you take a look at,     10:11:32  
13          you know, DW-2 and V-160 and travel maybe a half     10:11:40  
14          mile north of where that -- the -- you know, north     10:11:46  
15          of -- north of those wells but still within the     10:11:54  
16          plume path, do you have any information to define     10:11:58  
17          the leading edge, like, half mile north -- half mile     10:12:01  
18          north of the V-160 and DW-2 wells?     10:12:05  
19          A     There's -- I haven't looked at data north     10:12:10  
20          of V-160, a half a mile, no.     10:12:12  
21          Q     Okay. Is there any data north -- regarding     10:12:15  
22          perchlorate a half mile north of V-160?     10:12:21  
23          A     Not that I've reviewed.     10:12:24  
24          Q     Do you know who Tony Daus is?     10:12:31  
25          A     Yes.     10:12:33

1 Q And who is he? 10:12:34

2 A Tony Daus? 10:12:40

3 Q Yes. 10:12:41

4 A He is with GSI. 10:12:42

5 Q Okay. And have you talked with Mr. Daus? 10:12:43

6 A Yes. 10:12:45

7 Q How many times? 10:12:46

8 A I went to grad school with Mr. Daus, so 10:12:47

9 quite a few times. I've worked with him for ten 10:12:51

10 years at Geomatrix. 10:12:54

11 Q Yeah, I understand that this case is full 10:12:56

12 of University of Waterloo hydrogeologists. 10:12:59

13 A That's a good thing in my opinion. 10:13:04

14 Q Did you know of Mr. Trudell when you were 10:13:06

15 going to school there? 10:13:09

16 A Actually, no. I believe he was there after 10:13:10

17 I was. 10:13:13

18 Q And what -- like in terms of this matter, 10:13:13

19 when have you talked -- what have you discussed with 10:13:22

20 Mr. Daus? 10:13:25

21 A I actually haven't had any discussions with 10:13:26

22 Mr. Daus about the case. 10:13:29

23 Q Have you read his expert report, either 10:13:31

24 before or after you submitted your expert report? 10:13:37

25 A I don't believe so, no. 10:13:39

1 Q Did you have -- were you curious as to what 10:13:47  
2 his conclusions were and whether any of his 10:13:50  
3 conclusions supported or conflicted with your -- 10:13:57  
4 your opinions? 10:13:58

5 A I believe Mr. Daus through counsel, what I 10:14:04  
6 believe is he was looking at the on-site extraction 10:14:07  
7 system, and I didn't really have anything to do with 10:14:12  
8 that, so no. 10:14:15

9 Q Has anybody -- counsel or anybody told you 10:14:23  
10 that Mr. Daus has a theory that because 10:14:26  
11 contamination was found in the three most-western 10:14:35  
12 wells of OU-4 have no contamination -- VOC 10:14:39  
13 contamination, that VOC contamination did not 10:14:46  
14 migrate off-site? 10:14:49

15 A I wasn't really aware of that. Actually as 10:14:55  
16 you read my expert report, that's my opinion also. 10:14:57

17 Q And since you didn't talk to him, you came 10:14:59  
18 up with that opinion independently of Mr. Daus? 10:15:03

19 A Yes. 10:15:08

20 Q Did you have any say in the retention of 10:15:08  
21 Mr. Daus as to whether you recommended him or didn't 10:15:24  
22 recommend him or did you make any recommendations 10:15:27  
23 about Mr. Daus to Whittaker Corporation or its 10:15:31  
24 counsel? 10:15:34

25 A None, no. 10:15:35



1 Q Did you talk to Mr. Steve Lewis at all 10:15:40  
2 during your engagement in this -- in this matter? 10:15:57  
3 A No. 10:15:59  
4 Q Did you talk to Dr. Shoup at all during 10:15:59  
5 your engagement in this matter? 10:16:03  
6 A No. 10:16:05  
7 Q And how about Mr. Dawson? 10:16:09  
8 A I believe I talked to him once a number of 10:16:14  
9 months ago. 10:16:20  
10 Q And what did you talk about? 10:16:22  
11 A Actually I didn't ask him any questions. I 10:16:24  
12 was on a call with counsel, and he was talking about 10:16:33  
13 perchlorate and the history of the site. 10:16:36  
14 Q And was anybody else on that -- on that 10:16:44  
15 call? 10:16:46  
16 A I believe Bassi Edlin counsel was on that 10:16:47  
17 call, yes. 10:16:49  
18 Q Okay. Who from the Bassi Edlin firm was on 10:16:50  
19 that call? 10:16:54  
20 A That was quite a few months ago. You're 10:16:54  
21 testing my memory, Mr. Gee. Likely Mr. Blum was on 10:16:58  
22 that call. I can't remember who else. 10:17:02  
23 Q Was Mr. Hagstrom? 10:17:05  
24 A He may have been. I can't remember. I've 10:17:08  
25 had quite a few phone calls. 10:17:11

1 Q And how about -- I guess it's Dr. Steffy, 10:17:15  
2 have you heard that name? 10:17:19  
3 A Yes. 10:17:22  
4 Q And have you had any discussions with him? 10:17:23  
5 A I talked to him once, and he was looking 10:17:26  
6 for data, and so that means he got the data he was 10:17:30  
7 looking for. 10:17:37  
8 Q Did you talk about anything other than 10:17:37  
9 data? 10:17:39  
10 A No, he was -- he was new. I talked to him 10:17:44  
11 when he was first retained. He was looking for 10:17:45  
12 data. I told him what data he should -- you know, 10:17:47  
13 where it was and how to get it and that sort of 10:17:51  
14 thing. 10:17:53  
15 Q Where did you advise him to get data? 10:17:58  
16 A Through Bassi. 10:18:00  
17 Q Mr. Hokkanen, who provided you with the 10:18:01  
18 records that you used in this matter? 10:18:15  
19 A Two sources. One, I obtained records 10:18:17  
20 through the Bassi law firm and also on the 10:18:23  
21 Geotracker and EnviroStor on-site databases. 10:18:28  
22 Q And who provided you with documents from 10:18:34  
23 the Bassi firm? 10:18:37  
24 A Primarily an associate, his name is Daniel 10:18:44  
25 Trowbridge. 10:18:47

1 Q Were there any records that you wanted to 10:18:52  
2 receive but -- and asked for but did not receive? 10:18:55  
3 A I don't believe so. I asked for quite a 10:19:01  
4 few documents as time went on, and they were able to 10:19:04  
5 find those. I can't remember any specifically that 10:19:07  
6 they didn't have. 10:19:10  
7 Q Okay. 10:19:12  
8 THE REPORTER: Who's sharing a document? 10:19:24  
9 MR. HAGSTROM: I just want to say that on 10:19:24  
10 my video screen, all I can see is Gary's report. Is 10:19:26  
11 that -- have we moved on to that? 10:19:30  
12 THE WITNESS: I think you must have shared 10:19:35  
13 it or something -- 10:19:36  
14 MR. GEE: Not intentionally. 10:19:38  
15 THE REPORTER: Somebody is sharing the 10:19:40  
16 screen. 10:19:43  
17 MR. GEE: How do I get out of that? 10:19:43  
18 Can we go off the record just for a minute 10:19:52  
19 here? 10:19:55  
20 THE VIDEOGRAPHER: It should be up at the 10:19:55  
21 top, stop share, okay. 10:19:57  
22 One moment. We'll go off the record. 10:20:00  
23 We're going off the record at 10:19. 10:20:02  
24 (Discussion held off the record.) 10:20:04  
25 THE VIDEOGRAPHER: We're back on the 10:21:13

1 record. The time is 10:21. Please proceed. 10:21:15

2 BY MR. GEE:

3 Q Mr. Hokkanen, did you ask to see any 10:21:17

4 environmental reports that predated 1987? 10:21:20

5 A I don't believe I did from memory, no. 10:21:32

6 Q Okay. 10:21:36

7 A I don't remember ever reviewing reports 10:21:37

8 prior to that date. 10:21:38

9 Q Did you ask for any records that predated 10:21:41

10 1987? 10:21:46

11 A I don't remember that I did. No, I don't 10:21:48

12 believe so. 10:21:51

13 Q Okay. In your opinion, you discuss a 10:21:51

14 number of what we call hydrostatic units or HSUs. 10:22:01

15 Can you describe whether or not there's any 10:22:10

16 conductivity between the hydrostatic units? 10:22:12

17 A From the reports that I've read, yes, there 10:22:15

18 appears to be some hydraulic connection between the 10:22:20

19 different HSUs, yes. 10:22:25

20 Q Okay. Is it -- are there any HSUs that 10:22:27

21 you're aware of that are completely isolated from 10:22:29

22 other HSUs? 10:22:33

23 A Not that I'm aware of, no. I will also say 10:22:35

24 that there's a large area, the connections between 10:22:43

25 these different units aren't exactly known, but the 10:22:47

1 reports that I've read say based on the data that's 10:22:51  
2 been collected, that there is hydraulic connection 10:22:56  
3 between the different units to a certain extent. 10:22:59  
4 Q But is it accurate to say that there is 10:23:02  
5 connections, but we don't know where? 10:23:08  
6 A Generally, that's true, yes. It's a pretty 10:23:10  
7 large area that we're -- that we're involved in. 10:23:16  
8 Q Now, earlier you indicated that 10:23:19  
9 hydrogeologists would like to have more data 10:23:28  
10 whenever possible to refine their opinions. 10:23:31  
11 Is that -- is that an accurate statement? 10:23:34  
12 MR. HAGSTROM: I'm going to object. That 10:23:38  
13 mischaracterizes his testimony, at least the second 10:23:40  
14 half of your question does. 10:23:44  
15 THE WITNESS: Scientists and 10:23:46  
16 hydrogeologists in your example, we would always 10:23:49  
17 like to have more data, that's correct. 10:23:53  
18 BY MR. GEE: 10:23:55  
19 Q Okay. Would it have been helpful to have 10:23:55  
20 groundwater monitoring data dating back to the 10:23:59  
21 1980s? 10:24:02  
22 A Without having the data in hand, it's hard 10:24:06  
23 to tell, but as we just discussed, more data is 10:24:09  
24 always better. Would it have helped the 10:24:14  
25 understanding of the site, potentially. 10:24:19

1 Q Okay. Do you know when Whittaker actually 10:24:23  
2 began installing groundwater monitoring wells at the 10:24:39  
3 site? 10:24:43  
4 A I believe it was the mid '80s. 10:24:43  
5 Q I believe one of the drawings that you had 10:25:02  
6 in your report came from a containment study. I'm 10:25:08  
7 not going to go to that drawing right now, but do 10:25:11  
8 you know what a containment study is? 10:25:14  
9 A The video -- the audio is a little fuzzy. 10:25:15  
10 Could you say that again, sir? 10:25:19  
11 Q Do you know what a containment evaluation 10:25:21  
12 or containment study is? 10:25:23  
13 A Yes. 10:25:27  
14 Q And what -- what is a containment study? 10:25:27  
15 A Well, I believe what you're referring to is 10:25:30  
16 you're looking at essentially what we call a capture 10:25:33  
17 zone for a well or wells, where the water to a well 10:25:36  
18 or wells is coming from. 10:25:40  
19 Q Now, what is the purpose of a containment 10:25:48  
20 study? Why don't people run them? 10:25:50  
21 A Well, I think -- I'll expand on my answer. 10:25:53  
22 What you're probably looking at -- what you're 10:26:01  
23 referring to is containing a plume, for example, and 10:26:04  
24 so you're looking to see if wells -- the capture 10:26:11  
25 zones from wells will capture an entire plume or 10:26:13

1 parts of a plume. 10:26:17

2 You're looking to see how much you can 10:26:18

3 capture, how much you can contain is another way to 10:26:20

4 put it. 10:26:24

5 Q And do you know what -- like, are you aware 10:26:28

6 of a containment study that was conducted by CH2M 10:26:30

7 Hill back in 2004 or thereabouts? 10:26:36

8 A Yes. 10:26:41

9 Q And do you know what the specific purpose 10:26:42

10 of that containment study is or was? 10:26:43

11 A I believe it was related to the perchlorate 10:26:45

12 in the area. 10:26:53

13 Q Okay. And do you recall what the study was 10:26:58

14 set out to do? 10:27:00

15 A My understanding -- 10:27:03

16 Q Sorry. Go ahead. I didn't mean to talk 10:27:04

17 over you. 10:27:07

18 A It will happen from time to time. 10:27:08

19 Generally I believe it was to examine through peer 10:27:12

20 modeling what the capture zones or what the 10:27:19

21 containment areas were of the various Saugus 10:27:20

22 production wells. 10:27:23

23 Q Did the report try to evaluate whether 10:27:31

24 pumping Saugus-1 and Saugus-2 at different rates may 10:27:36

25 be able to contain VOC contamination from migrating 10:27:42

1 downgradient? 10:27:48

2 A I believe the -- at that point in time, I 10:27:49

3 believe it was more focused on perchlorate 10:27:53

4 containment. 10:27:55

5 Q That's correct. Did I say VOC containment? 10:27:56

6 THE REPORTER: Yes. 10:28:03

7 THE WITNESS: Is there a question? 10:28:04

8 BY MR. GEE:

9 Q Yeah, I'm sorry. If I said 10:28:05

10 VOC -- VOC containment, I meant perchlorate 10:28:07

11 containment. 10:28:11

12 A Yeah, I think it was focused on perchlorate 10:28:11

13 containment, yes. 10:28:14

14 Q Okay. And do you recall what the report 10:28:15

15 concluded generally as to whether pumping Saugus-1 10:28:18

16 and Saugus-2 would prevent downgradient migration of 10:28:24

17 perchlorate? 10:28:29

18 MR. HAGSTROM: I'm going to object. It's 10:28:30

19 vague, compound. 10:28:32

20 But go ahead, Gary -- Mr. Hokkanen. 10:28:33

21 THE WITNESS: The report looked at not only 10:28:35

22 the capture zones or the containment from Saugus-1 10:28:42

23 and 2 would be, but also V-201, V-205, and 160. And 10:28:46

24 I believe -- I believe the general conclusion was 10:28:52

25 that those wells had a good chance to contain the 10:28:58



1 perchlorate plume. 10:29:03

2 BY MR. GEE: 10:29:06

3 Q Okay. Do you recall whether that report 10:29:06

4 concluded or recommended whether V-205 be used as a 10:29:16

5 containment well to contain -- 10:29:22

6 A I don't -- 10:29:29

7 THE REPORTER: I'm sorry. To do what? 10:29:29

8 THE WITNESS: I don't recall, no. We can 10:29:32

9 look at the report and look at the recommendations, 10:29:33

10 but I don't specifically remember what they said 10:29:35

11 about V-205. 10:29:37

12 MR. GEE: Okay. 10:29:38

13 Q Do you recall whether one of the objectives 10:29:41

14 of the report was to determine operating Saugus-1 10:29:44

15 and Saugus-2 could be done in a manner to contain 10:29:50

16 perchlorate contamination from impacting V-205? 10:29:55

17 MR. HAGSTROM: It's outside the scope of 10:29:59

18 his assignment. 10:30:01

19 BY MR. GEE: 10:30:06

20 Q You can answer. 10:30:07

21 A Yeah, I don't remember. My -- my interest 10:30:08

22 in that report was the capture zones, had they 10:30:10

23 moved, and I was less focused on what the -- your 10:30:15

24 questioning about the objectives and the 10:30:19

25 conclusions, how they related to the various wells 10:30:20

1 and perchlorate containment, we could look at their 10:30:23  
2 report, but I don't specifically remember, sir. 10:30:27

3 Q Okay. Is it true, Mr. Hokkanen, that the 10:30:30  
4 higher capacity you operate a pump, the larger the 10:30:38  
5 containment zone would be for that well and pump? 10:30:42

6 A In general, yes, that's true. 10:30:46

7 Q And when you run a containment study, do 10:30:48  
8 you normally run different scenarios for -- at 10:30:58  
9 different pumping rates? 10:31:02

10 A I've actually done studies such as that, 10:31:04  
11 and if your goal is to contain a plume, then, yes, 10:31:08  
12 your objective is to see what rate you would need to 10:31:15  
13 pump a well or wells to contain the plume. 10:31:18

14 Q Mr. Hokkanen, in your report, you discuss 10:31:22  
15 TCE and PCE. I believe you described them as being 10:31:41  
16 DNAPLs. 10:31:47

17 What is a DNAPL? 10:31:48

18 A First, TCE and PCE are chemicals. They can 10:31:54  
19 be in various forms. They can be in a vapor form. 10:31:58  
20 It can be in a pure form, which is -- to answer your 10:32:01  
21 question, generally is what we call a DNAPL in 10:32:05  
22 hydrogeology. And a DNAPL is a chemical that's more 10:32:10  
23 dense than water. It's a dense nonaqueous phase 10:32:15  
24 liquid is what DNAPL stands for. 10:32:22

25 Q Okay. Now, you mentioned in its pure form. 10:32:24

1 Would PCE -- for instance, if I'm looking at a 10:32:27  
2 hydrostatic unit, would TCE tend to concentrate at 10:32:32  
3 the bottom of the hydrostatic unit, the middle of 10:32:36  
4 the hydrostatic unit, or top -- where would TCE tend 10:32:40  
5 to -- tend to concentrate in its dissolved form? 10:32:44  
6 A As a DNAPL or dissolved? 10:32:47  
7 Q Dissolved. 10:32:50  
8 A Well, the TCE doesn't concentrate in any 10:32:51  
9 particular place. A dissolved chemical, such as 10:32:56  
10 TCE, will move with the groundwater. Wherever the 10:32:59  
11 groundwater goes, that's where the dissolved 10:33:03  
12 chemical is going. 10:33:06  
13 Q Okay. If TCE -- dissolved TCE is moving 10:33:08  
14 with the groundwater and not -- and is migrating, 10:33:14  
15 let's say, in the middle of a hydrostatic unit, 10:33:21  
16 would it tend to move at the same velocity as to 10:33:24  
17 groundwater? 10:33:27  
18 A TCE, no. 10:33:28  
19 Q Okay. And why is that? 10:33:29  
20 A Well, TCE, there is a phenomenon that we 10:33:32  
21 call retardation and retardation, what that means is 10:33:38  
22 that a chemical, such as TCE, is adsorbed by the 10:33:42  
23 aquifer materials to a certain extent, and it gets 10:33:48  
24 retarded or it slows down the movement in relation 10:33:52  
25 to the movement of the groundwater. 10:33:55

1 Q Okay. Now, wouldn't -- in order to be 10:33:57  
2 retarded, wouldn't the dissolved TCE have to be in 10:34:02  
3 contact with something in the aquifer? 10:34:08  
4 A Yes, and it is. 10:34:11  
5 Q And what is it normally contacting that -- 10:34:15  
6 that slows down its migration? 10:34:21  
7 A Well, it's whatever the aquifer material is 10:34:22  
8 and the material also in the aquifer. Organic 10:34:29  
9 carbon is generally what we consider that TCE and 10:34:35  
10 like chemicals adsorb to. 10:34:40  
11 Q Okay. I'm sorry. What was that term that 10:34:42  
12 you used, that TCE absorbs onto? 10:34:48  
13 A Well, TCE will adsorb onto a lot of things, 10:34:50  
14 but generally what the literature has shown is that 10:34:55  
15 organic carbon is what it adsorbs to. 10:34:58  
16 Q Okay. And is there a lot of organic carbon 10:35:05  
17 located in the aquifers that you studied at the -- 10:35:09  
18 in the Saugus Formation? 10:35:12  
19 A I don't believe it's been measured from 10:35:14  
20 what I've seen. I haven't run across any organic 10:35:16  
21 carbon content in these aquifers. 10:35:21  
22 Q Okay. If -- so you're saying that it 10:35:24  
23 hasn't been measured as opposed to it doesn't exist; 10:35:27  
24 is that correct? 10:35:30  
25 A Oh, it -- it likely exists. What I'm 10:35:31

1 saying is that I haven't seen data for organic 10:35:37  
2 carbon in these aquifers. 10:35:41  
3 Q Okay. And is carbon -- carbon material, is 10:35:43  
4 it suspended in the aquifers or is it on -- or is it 10:35:47  
5 generally along the walls of the aquifers? 10:35:52  
6 A It's associated with the solid portion that 10:35:58  
7 the aquifer consists of, yes. 10:36:04  
8 Q Okay. So it may be, for example, in an 10:36:07  
9 aquitard? 10:36:10  
10 A Yes, could be. 10:36:11  
11 Q But, in general, if you had -- if it's not 10:36:14  
12 an aquitard or if it's not along the surface -- a 10:36:21  
13 solid surface associated with the aquifer, you 10:36:28  
14 generally won't have that carbon material; is 10:36:34  
15 that -- is that correct? 10:36:37  
16 MR. HAGSTROM: I'm going to object. That's 10:36:37  
17 compound. 10:36:38  
18 Go ahead, Mr. Hokkanen. 10:36:39  
19 THE WITNESS: I'm sorry, Mr. Gee. That was 10:36:40  
20 a long question. If you could repeat that, I'd 10:36:42  
21 appreciate it. 10:36:45  
22 BY MR. GEE: 10:36:45  
23 Q Okay. Is the -- this carbon material that 10:36:45  
24 you're talking about more associated with the 10:36:51  
25 groundwater surface contact with, for example, the 10:36:54

1 clay or silt materials that line an aquifer? 10:37:00

2 A That line the aquifer, I'm not sure what 10:37:06

3 you mean by that, but it's generally found within 10:37:13

4 aquifer materials, and it varies from site to site. 10:37:20

5 And as I testified to earlier, I haven't seen any 10:37:24

6 data in this vicinity. 10:37:27

7 Q And where it says aquifer is material 10:37:31

8 normally located within an aquifer or within a 10:37:34

9 hydrostatic unit? 10:37:41

10 A Well, I'll give you a simple example. If 10:37:43

11 this particular aquifer were all sand, it's the 10:37:48

12 sand. 10:37:52

13 Q Okay. But what -- 10:37:55

14 A That's what we call the aquifer material. 10:37:56

15 Q Okay. Now, would that sand be generally 10:37:58

16 suspended or would it be aggregated along the walls 10:38:01

17 or the floor of the aquifer? 10:38:07

18 A I have to tell you, I -- the walls and the 10:38:09

19 floor of the aquifer, you're going to have to define 10:38:14

20 that for me. Those aren't terms that 10:38:17

21 hydrogeologists use. 10:38:20

22 Q Okay. What would you call the boundaries 10:38:21

23 of an aquifer or the materials, are they the -- the 10:38:24

24 areas that bound an aquifer, what would a 10:38:31

25 hydrogeologist call that? 10:38:34

1           A     Well, aquifers are defined in different           10:38:35  
2           ways. Sometimes we define aquifers independently by   10:38:47  
3           the type of material in an aquifer, but there           10:38:52  
4           generally isn't something lining the aquifer or       10:38:58  
5           bonding the aquifer. Sometimes there are, but       10:39:01  
6           commonly not.   10:39:04

7           Q     Okay. Let me ask the question. Is the --       10:39:05  
8           is this carbon material suspended in the groundwater   10:39:13  
9           in the aquifer?                                       10:39:16

10          A     No, it's just the other way around. The       10:39:20  
11          aquifer materials, sand or clay or silt, they're     10:39:22  
12          basically stable. The water moves in and around     10:39:27  
13          those materials. It's not the other way around as     10:39:30  
14          you described it.                                     10:39:38

15          Q     Okay. I just wanted to understand that       10:39:39  
16          concept.   10:39:41

17                Mr. Hokkanen, do you know what -- before I     10:39:53  
18          ask the question, any time you need a break, let me   10:39:55  
19          know. I mean this isn't an endurance test.       10:39:58

20          A     I will. Yes, thank you.                       10:40:01

21          Q     Okay. I note that, as I am, you're           10:40:02  
22          drinking quite a bit of fluids. So that may       10:40:06  
23          precipitate some sort of reaction that we need to     10:40:09  
24          address.   10:40:12

25          A     It may.   10:40:13

1 Q Mr. Hokkanen, are you familiar with the 10:40:14  
2 term "pumping test"? 10:40:23  
3 A Yes. 10:40:26  
4 Q And what is a pumping test? 10:40:26  
5 A Pumping test is when we pump water out of a 10:40:29  
6 well, and we measure the response of water levels in 10:40:37  
7 wells distant from that well that you're pumping. 10:40:41  
8 Q And what are you trying to determine when 10:40:45  
9 you're running a pumping test? 10:40:48  
10 A Generally speaking, we're trying to 10:40:50  
11 determine a characteristic of the aquifer, what we 10:40:53  
12 call hydraulic conductivity. 10:40:58  
13 Q And as a hydrogeologist, what is hydraulic 10:41:00  
14 conductivity? 10:41:00  
15 A Hydraulic conductivity is a measure of the 10:41:08  
16 ability of an aquifer to transmit water. So 10:41:11  
17 hydraulic conductivity, it transmits water easily. 10:41:15  
18 A low hydraulic conductivity, less so. 10:41:20  
19 BY MR. GEE: 10:41:25  
20 Q Okay. In a scenario where you ran a pump 10:41:25  
21 test and you start operating a pump and there is no 10:41:28  
22 response from -- in another well, is that a sign 10:41:33  
23 that there is no hydraulic conductivity between the 10:41:39  
24 two wells? 10:41:45  
25 A You mean hydraulic connection. 10:41:45



1 Q Yeah, I -- 10:41:49

2 A There's a difference. 10:41:50

3 Q That's a better term, yes. 10:41:51

4 A Yeah. It depends on where the well is. 10:41:52

5 There's not a yes or no to that. 10:41:56

6 Q Okay. And what factors would, you know -- 10:41:59

7 like you say, it depends on where the well is. 10:42:06

8 What factors would you consider in the 10:42:10

9 determination of the location of the well as to 10:42:14

10 whether or not a pump test would show -- would prove 10:42:19

11 hydraulic connect -- conductivity? 10:42:27

12 A Well, one would be the distance from the 10:42:31

13 well to the pumping well. I'll give you an extreme 10:42:34

14 example. If you have a well that's located 20 miles 10:42:38

15 from a well you're pumping, you're likely not going 10:42:40

16 to a see response. 10:42:46

17 And the distance away from the well that 10:42:47

18 you would see a response depends on how much you're 10:42:49

19 pumping and the aquifer materials themselves. Also 10:42:53

20 if you're pumping in a specific aquifer, let's say 10:42:56

21 aquifer D and you're monitoring a well above aquifer 10:43:02

22 A, you may see a response, but that response may 10:43:07

23 take a while to transmit through and up to layer A 10:43:09

24 from layer D. So you may not see an immediate 10:43:14

25 response, but you may see a response with time. 10:43:17

1 Q Okay. And is that because the conductivity 10:43:20  
2 between those two wells are rather tortuous or 10:43:26  
3 tenuous where the -- the -- well, strike that 10:43:30  
4 question. 10:43:39

5 So let me give you an example. If I was 10:43:43  
6 running a pumping test in a well for which I 10:43:48  
7 believe -- I believe -- I don't have any factual 10:43:57  
8 basis to determine whether or not it's true or 10:44:00  
9 not -- a well is hydraulically connected. 10:44:03

10 And I run the pump test for, let's say, 10:44:12  
11 90 days and there are other wells in the area that 10:44:17  
12 respond to the pump test, but the one that's located 10:44:23  
13 in the same general location does not. 10:44:31

14 Does that -- does the lack of movement or 10:44:34  
15 lack of response in that one well an indication that 10:44:37  
16 that one well is not hydraulically connected to the 10:44:44  
17 aquifer? 10:44:48

18 A Depends on the circumstances. 10:44:49

19 Q And what circumstances did I leave out that 10:44:53  
20 would explain that type of reaction? 10:44:57

21 A Well, there are quite a few. The distance 10:45:01  
22 between the well screen that you're pumping and the 10:45:05  
23 well that you're monitoring, the aquifer materials 10:45:09  
24 in between those two points, and then how long 10:45:12  
25 you're pumping. 10:45:15

1 Sometimes three months may be in your 10:45:17  
2 scenario maybe long enough. Sometimes maybe not 10:45:19  
3 long enough. It depends on what the actual 10:45:24  
4 conditions are. 10:45:26  
5 Q Okay. But in my scenario, we have a 10:45:27  
6 single well that's within a well cluster in the same 10:45:29  
7 basically geographic proximity of the pumping well. 10:45:35  
8 Does that change your analysis as to 10:45:42  
9 what -- your analysis as to the factors you need to 10:45:47  
10 consider? I mean one of your factors is the 10:45:52  
11 distance from -- from the pumping well? 10:45:55  
12 MR. HAGSTROM: I'm going to object. That's 10:45:59  
13 vague, compound or at least I don't understand 10:46:01  
14 question. 10:46:03  
15 But, Mr. Hokkanen, if you do, please 10:46:03  
16 proceed. 10:46:07  
17 THE WITNESS: Well, as I testified just 10:46:08  
18 earlier, it depends on the actual circumstances of 10:46:13  
19 the pumping, the aquifer conditions, the distance 10:46:18  
20 between the pumping well, vertically or 10:46:22  
21 horizontally. 10:46:28  
22 Vertically could be very important because, 10:46:29  
23 generally speaking, the hydraulic conductivity 10:46:32  
24 vertically is less than horizontally. So it's hard 10:46:34  
25 to answer a general question like that. It depends 10:46:37

1 on what the circumstances are. 10:46:40

2 BY MR. GEE: 10:46:42

3 Q Okay. Now, you say there's hydrogeological 10:46:42

4 conditions. 10:46:47

5 So if I have two wells that is located in 10:46:48

6 close proximity to the pumping well, one changes -- 10:46:52

7 one responds to the pump -- you know, startup of a 10:46:59

8 pump, one does not. You run this test for, let's 10:47:02

9 say, a year. 10:47:09

10 What hydrogeological conditions would 10:47:11

11 explain why that one well is not responding and yet 10:47:14

12 connected to the same aquifer as the pumping well? 10:47:18

13 MR. HAGSTROM: I'm going to object. It's 10:47:23

14 vague. 10:47:24

15 THE WITNESS: Yeah, your -- your 10:47:31

16 hypothetical is -- is, as Mr. Hagstrom said, a 10:47:33

17 little vague. 10:47:38

18 What are the distances between these wells, 10:47:39

19 are they in the same aquifer, how much is the well 10:47:41

20 pumping. I can't answer a vague question like that. 10:47:46

21 I apologize, sir. 10:47:51

22 BY MR. GEE: 10:47:51

23 Q Okay. Let me make it easier. Assume that 10:47:51

24 we don't know whether they're in the same aquifer. 10:47:54

25 Assume that we don't know whether or not they're in 10:47:58

1 the same aquifer. Assume that each well is 10:48:00  
2 approximately -- or approximately equal distance 10:48:07  
3 from the pumping well, and that one well responds, 10:48:12  
4 and the other well does not. 10:48:21  
5 What hydrogeological conditions would 10:48:23  
6 explain why the well that is not responding is 10:48:26  
7 behaving in that manner? 10:48:34  
8 MR. HAGSTROM: I'm going to object; still 10:48:35  
9 vague, calls for speculation, incomplete 10:48:36  
10 hypothetical. 10:48:38  
11 THE WITNESS: Are the two monitoring wells 10:48:38  
12 screened at the same depth, sir? 10:48:43  
13 BY MR. GEE: 10:48:45  
14 Q Well, let's say we don't know. 10:48:45  
15 A Well, that would be one of the first things 10:48:53  
16 I would look at is where the wells are screened and 10:48:55  
17 where they're screened in relation to the pumping 10:48:58  
18 well. 10:49:02  
19 Q Okay. Wouldn't the nonresponse of the one 10:49:02  
20 well not responding suggest that it may not be 10:49:08  
21 screened in the same aquifer as the well that is 10:49:11  
22 pumping? 10:49:16  
23 A Well, there are a number of possible 10:49:20  
24 explanations depending on the circumstances that 10:49:23  
25 you're referring to. I just don't have enough 10:49:25

1 information to answer that. 10:49:28

2 Q Okay. And what -- I mean I'm a little bit 10:49:29

3 at a loss -- what further information do you need to 10:49:33

4 answer that question? 10:49:37

5 A How far are the monitoring wells, did you 10:49:38

6 say, from the pumping well -- 10:49:40

7 Q Okay. 10:49:42

8 A -- what aquifer -- are they screened in the 10:49:43

9 same aquifer, what are the lengths of the screens, 10:49:45

10 what is the hydraulic conductivity variation between 10:49:49

11 the pumping well and the monitoring wells. 10:49:53

12 There's a lot of information that we would 10:49:56

13 look at to try to answer that question, and I don't 10:49:58

14 have that information. 10:50:00

15 Q Okay. As I say, let's -- let's -- for this 10:50:01

16 hypothetical, let's assume that it is established 10:50:06

17 that these monitoring wells are well within the zone 10:50:11

18 of influence of that pumping well. That's a fact of 10:50:17

19 the matter. 10:50:24

20 Let's say that we don't know where these 10:50:25

21 wells are screened. They may be in the same 10:50:28

22 aquifer. They may not be. 10:50:32

23 Does the lack of response in that one 10:50:35

24 monitoring well that does not show response 10:50:41

25 indicative that it may not be hydrogeologically 10:50:45

1 connected to the pumping well, and if not, what 10:50:49  
2 geological factors would you consider to 10:50:53  
3 determine -- what other geo -- geo -- geological 10:50:59  
4 conditions would cause that pump or that well not to 10:51:03  
5 respond? 10:51:07

6 MR. HAGSTROM: Objection. It's ambiguous, 10:51:09  
7 vague. He's answered this a couple times. 10:51:11

8 THE WITNESS: Well, it -- I'll say, you 10:51:15  
9 know, as a hydrogeologist, what I would do is I 10:51:20  
10 would look at again -- and I think I've already 10:51:24  
11 testified to this -- I would need to know -- to 10:51:27  
12 answer your question, I would need to know what -- 10:51:29  
13 where the well screen for the pumping well is, where 10:51:33  
14 the well screens for the monitoring wells are, what 10:51:36  
15 distance they are, how much they're pumping, what 10:51:39  
16 the hydrogeologic conditions are between the pumping 10:51:43  
17 and the monitoring wells, the condition of the 10:51:48  
18 monitoring wells, maybe one is plugged, maybe not, 10:51:52  
19 how -- when were they installed. 10:51:55

20 There's a lot of factors that would go in 10:51:57  
21 to try to answer your hypothetical. 10:52:00

22 BY MR. GEE: 10:52:02

23 Q Okay. But I gave you a lot of different 10:52:02  
24 parameters. You know, like if -- if we assume 10:52:05  
25 that -- that the wells are in good operating 10:52:12

1 condition, if we assume that you've done your -- 10:52:15  
2 your well -- your groundwater well monitoring test 10:52:19  
3 and when you've taken a sample, the well level 10:52:23  
4 responds to, you know, like you're taking a sample, 10:52:27  
5 let's say that, you know, again, you have -- you 10:52:31  
6 believe that they're screened in the same location, 10:52:36  
7 but you don't know or in the same -- in the same 10:52:39  
8 aquifer. 10:52:42

9 What other hydrogeological condition would 10:52:45  
10 you be looking for that would explain the 10:52:49  
11 nonresponse? 10:52:51

12 A Would you like me to answer? I've answered 10:52:55  
13 it three or four times. I'll answer it again. I 10:52:58  
14 would want to know what the geological and 10:53:01  
15 hydrogeologic conditions are between the pumping 10:53:05  
16 well and the monitoring wells. 10:53:08

17 I would like to know where the well screen 10:53:09  
18 for the pumping well is, how much you're pumping. 10:53:12  
19 I'll give you an extreme example. If you're pumping 10:53:15  
20 at five gallons a minute or 500 gallons a minute, 10:53:18  
21 it's going to make a difference. 10:53:20

22 But the geological and hydrogeologic 10:53:21  
23 conditions are between these two points, and also 10:53:25  
24 where the monitoring wells are screened in relation 10:53:26  
25 to the pumping well. There could be several 10:53:29



1 explanations -- the bottom line is there could be 10:53:32  
2 several explanations depending on the conditions. 10:53:34  
3 BY MR. GEE: 10:53:36  
4 Q All right. Assuming that the well is 10:53:36  
5 pumping at its maximum capacity, assume that it's 10:53:40  
6 within the area of influence -- that the monitoring 10:53:44  
7 wells are within the area of influence of the 10:53:47  
8 pumping well, assume that -- that the wells are in 10:53:50  
9 good operating condition and assume that you think 10:53:57  
10 they're -- they may be in the same hydrostatic 10:54:04  
11 units, but you don't know. 10:54:07  
12 One well has influenced -- I'm trying to 10:54:10  
13 understand -- understand your answer by eliminating 10:54:15  
14 some of these unknowns. If -- if you have those 10:54:18  
15 conditions, what would explain the -- the lack of 10:54:24  
16 response in one well versus the response in another 10:54:29  
17 well? 10:54:34  
18 MR. HAGSTROM: Hang on. Hang on, 10:54:34  
19 Mr. Hokkanen. That's -- we've now gotten to a point 10:54:38  
20 where it's argumentative. He's been asked the same 10:54:41  
21 question at least half a dozen times. 10:54:43  
22 Go ahead, Mr. Hokkanen. 10:54:47  
23 THE WITNESS: I will tell you, Mr. Gee, I'm 10:54:51  
24 going to have trouble answering, but I'll try. 10:54:54  
25 I have a question first. You mentioned 10:54:58

1       that these hypothetical wells, the ones that we       10:55:00  
2       don't know where they're screened, are within the       10:55:06  
3       capture zone of the pumping well; is that correct?       10:55:09  
4       BY MR. GEE:       10:55:12  
5             Q       That would be correct.       10:55:12  
6             A       Okay. Now, capture zones for pumping wells       10:55:13  
7       often are confined to a specific aquifer or, for       10:55:19  
8       example, out at the Bermite site, portions of an       10:55:27  
9       aquifer.       10:55:30  
10            So you could have a well that's screened,       10:55:30  
11       you know, above or below a certain part of an       10:55:33  
12       aquifer or a certain aquifer that would not be, as       10:55:38  
13       you put it, within the capture zone of that well.       10:55:41  
14            It may be within the footprint of the       10:55:45  
15       capture zone, but a capture zone is defined as the       10:55:47  
16       area of an aquifer or aquifers that water goes to a       10:55:50  
17       pumping well.       10:55:56  
18            So, again, I'm not sure if, for example,       10:55:57  
19       it's not within the capture zone vertically, but I       10:56:01  
20       don't know where the well screens are.       10:56:08  
21            So I'm having trouble answering your       10:56:10  
22       question. I apologize.       10:56:12  
23            Q       Okay. Would it be -- would it be possible       10:56:14  
24       that if a well does not respond to a well pumping --       10:56:17  
25       in a well pumping test, even if it is within that       10:56:23

1 footprint, that the well may not actually be 10:56:28

2 connected to that aquifer? Is that a possibility? 10:56:30

3 A That's one of several possibilities, yes, 10:56:34

4 but there are a number of possibilities. 10:56:38

5 Q Okay. And what -- what other possibilities 10:56:39

6 are there if -- if a -- I think we're kind of going 10:56:44

7 around in circles. So I'm trying to break that 10:56:53

8 circle, so if -- 10:56:56

9 A What would really help me is if you had -- 10:56:59

10 you had a real-world situation, and I could answer 10:57:01

11 that. I'm -- hypothetical is a little hard to 10:57:06

12 really give you a good answer to. 10:57:10

13 Q Okay. Mr. Hokkanen, have you ever 10:57:12

14 experienced a situation where you're running a pump 10:57:15

15 test and one of the wells does not respond to the 10:57:18

16 pumping of another well? 10:57:24

17 A It's been a while since I've run a pumping 10:57:29

18 test. People generally don't do that very often 10:57:34

19 anymore. I don't recall a situation, no. 10:57:37

20 Q You've never ran a pumping test where 10:57:39

21 you've actually started up a pump and a monitoring 10:57:43

22 or another well did not respond? 10:57:47

23 A What my answer was was I don't recall that 10:57:49

24 occurring. It may have. I've run pumping -- I mean 10:57:54

25 I ran a bunch of pumping tests in the '80s and '90s. 10:58:01

1           Unfortunately that's been a little long to remember           10:58:05

2           that specific. Sorry.           10:58:07

3           Q       Okay. If one of your colleagues indicated           10:58:11

4           that the nonresponse of a pumping -- of a well to a           10:58:15

5           pumping test suggests that the well is not           10:58:20

6           responding, is not hydrogeologically connected,           10:58:23

7           would that be a viable explanation in your           10:58:27

8           professional opinion?           10:58:29

9                   MR. HAGSTROM: Calls for speculation.           10:58:30

10          BY MR. GEE:

11          Q       In your professional opinion.           10:58:33

12          A       Well, I believe you've asked me that exact           10:58:36

13          same question, and I believe my answer previously           10:58:38

14          was that is one of a number of possibilities.           10:58:45

15          Q       My question is: If I told you that that           10:58:47

16          was his interpretation, would that be a viable --           10:58:59

17          would he be a credible hydrogeologist?           10:59:02

18                   MR. HAGSTROM: Object; misleading, calls           10:59:05

19          for speculation.           10:59:08

20                   THE WITNESS: Mr. Gee, the video -- the           10:59:10

21          audio was a little fuzzy again. Could you repeat           10:59:13

22          the question?           10:59:16

23          BY MR. GEE:           10:59:16

24          Q       Okay. If another hydrogeological           10:59:16

25          professional told you that his interpretation of the           10:59:21

1 nonresponse of a well close to another well that is 10:59:25  
2 known -- that is being pumped is an indication that 10:59:35  
3 the wells are not hydrogeologically connected, would 10:59:40  
4 you consider that opinion or that analysis to be a 10:59:45  
5 viable explanation? 10:59:49

6 MR. HAGSTROM: I'm going to object. It's 10:59:53  
7 ambiguous. 10:59:54

8 Go ahead, Mr. Hokkanen. 10:59:55

9 THE WITNESS: I believe that's the same 10:59:56  
10 question you've asked before in a bit different way 10:59:58  
11 this time. My answer previously was -- and I'm 11:00:01  
12 going to answer it the same way, that that is one of 11:00:06  
13 a number of possibilities. 11:00:08

14 BY MR. GEE: 11:00:09

15 Q Okay. But I'm asking about whether this 11:00:09  
16 hydrogeologist that made that explanation is 11:00:13  
17 credible. 11:00:17

18 MR. HAGSTROM: Calls for speculation, 11:00:18  
19 outside the scope. 11:00:21

20 THE WITNESS: Is this someone I know or who 11:00:23  
21 is this hydrogeologist? 11:00:24

22 BY MR. GEE: 11:00:28

23 Q Anybody that -- that is a registered 11:00:28  
24 hydrogeologist, comes from a good academic 11:00:30  
25 background, works -- works in the field, has worked 11:00:33

1 in the field for over ten years. 11:00:38

2 MR. HAGSTROM: Calls for speculation. 11:00:41

3 THE WITNESS: I'm sorry, Mr. Gee. I don't 11:00:46

4 have an answer to that question. The hypothetical 11:00:48

5 is hard for me to answer. I mean I've seen -- I've 11:00:50

6 seen registered hydrogeologists give all sorts of 11:00:57

7 answers. So I don't know. 11:01:01

8 BY MR. GEE: 11:01:03

9 Q Okay. Let me ask the question this -- this 11:01:03

10 way. Suppose that you have a monitoring well that 11:01:06

11 is not responding to a pump test. 11:01:10

12 Would you rely on the information that's 11:01:13

13 coming from the nonresponsive well to provide 11:01:15

14 information on the aquifer from which the pumping 11:01:20

15 well is -- is drawing? 11:01:24

16 A Would I rely on that data? 11:01:29

17 Q Would you rely on that data? 11:01:31

18 A Really on a real circumstance, that data 11:01:32

19 actually could tell you something, yes. It depends. 11:01:39

20 It depends. 11:01:43

21 Q Okay. And what would it tell you? 11:01:44

22 A Depends on the circumstances. I don't 11:01:47

23 know. What would it tell you? Maybe the well is 11:01:51

24 clogged. Maybe -- there's -- there's a number of 11:01:54

25 different outcomes from that. 11:01:58

1 Q If the well was clogged, would you use data 11:02:00  
2 from that clogged well -- contamination data from 11:02:03  
3 that clogged well in forming an opinion regarding 11:02:06  
4 contamination? 11:02:09  
5 MR. HAGSTROM: That -- I don't understand 11:02:12  
6 that question at all. Vague. 11:02:14  
7 THE WITNESS: If a well was clogged -- if a 11:02:18  
8 well was clogged, would I use water quality data 11:02:21  
9 from that well? 11:02:24  
10 BY MR. GEE: 11:02:25  
11 Q Yes. 11:02:25  
12 A Well, a clogged well, it would be hard to 11:02:25  
13 get water from the aquifer out of it, and generally 11:02:36  
14 speaking, you wouldn't collect a water quality 11:02:39  
15 sample from a clogged well. It wouldn't be 11:02:41  
16 possible. 11:02:43  
17 Q Let's say there's water in that well, but 11:02:43  
18 you know that -- that it is clogged because when you 11:02:46  
19 draw from that well, there's always a little bit of 11:02:50  
20 a difference in the -- in the water level that 11:02:53  
21 you're -- that's in the well after you've drawn the 11:02:55  
22 sample. 11:02:59  
23 Would you rely on the data from that well? 11:02:59  
24 A Well, if a well was clogged, given our 11:03:01  
25 standard protocol for collecting water samples, you 11:03:05

1 wouldn't collect a water sample from a clogged well. 11:03:08

2 Q And would you -- and if you did, would you 11:03:11

3 rely on that data in -- in forming your opinion 11:03:14

4 about groundwater contamination? 11:03:19

5 MR. HAGSTROM: Asked and answered multiple 11:03:21

6 times. 11:03:23

7 THE WITNESS: I believe my answer was if a 11:03:28

8 well was truly clogged, you wouldn't collect a water 11:03:30

9 sample from that well. 11:03:34

10 BY MR. GEE: 11:03:35

11 Q And if you did, would you rely on that 11:03:35

12 information? 11:03:37

13 A No, you wouldn't collect a sample from a 11:03:37

14 clogged well because you wouldn't meet the protocol 11:03:41

15 for sampling. 11:03:44

16 Q So is it your opinion, if the well is 11:03:45

17 clogged, it can provide no useful information? 11:04:04

18 MR. HAGSTROM: That's vague, ambiguous. 11:04:08

19 MR. GEE: Mr. Hagstrom, you know, please 11:04:10

20 stop with the talking objections. 11:04:12

21 MR. HAGSTROM: Mr. Gee, the objection of 11:04:14

22 vague and ambiguous is not a speaking objection. 11:04:18

23 It's a valid objection. 11:04:19

24 MR. GEE: Yes, but your last objection was 11:04:22

25 I don't even understand the question. That's not a 11:04:24



1 valid objection, Mr. Hagstrom. 11:04:26

2 MR. HAGSTROM: I just objected that it's 11:04:28

3 vague and ambiguous. What else would you like me to 11:04:30

4 say, Mr. Gee? 11:04:31

5 MR. GEE: I'd like you to not say that I 11:04:32

6 don't understand that question. 11:04:36

7 MR. HAGSTROM: Okay. I'll just call -- 11:04:38

8 I'll just use vague and ambiguous from now on if 11:04:39

9 that makes it better for you. 11:04:42

10 MR. GEE: Yes, sir. 11:04:43

11 THE WITNESS: Mr. Gee, if -- I apologize. 11:04:46

12 If you could repeat the question, I would appreciate 11:04:48

13 it. 11:04:50

14 BY MR. GEE: 11:04:51

15 Q If you know a well is clogged, would you 11:04:51

16 use any -- would you use any information from that 11:04:55

17 well in your analysis of groundwater flow? 11:04:58

18 A Well, you wouldn't -- you wouldn't collect 11:05:03

19 a water sample, as I testified, and if you truly 11:05:05

20 knew it was clogged, water level data probably 11:05:10

21 wouldn't be used either. 11:05:13

22 Q Okay. So the answer is you wouldn't use 11:05:14

23 any information from that well? 11:05:17

24 A If you knew a well was clogged, you 11:05:18

25 wouldn't collect a sample, either a water quality 11:05:25

1 sample or a water level sample. 11:05:28

2 Q And if you don't have a sample, you 11:05:30

3 can't -- there is no information for you to use in 11:05:32

4 your analysis; is that correct? 11:05:34

5 MR. HAGSTROM: Objection; misstates -- 11:05:37

6 mischaracterizes his testimony. 11:05:39

7 THE WITNESS: Your question is: Would I 11:05:40

8 use data from that well? Is that your question? 11:05:44

9 BY MR. GEE: 11:05:47

10 Q My question is: If a well is plugged, 11:05:47

11 there wouldn't be any information -- useful 11:05:50

12 information for you to use in your analysis; is that 11:05:52

13 correct? 11:05:57

14 A If it was plugged, that's a true statement, 11:05:57

15 yes. 11:06:01

16 Q And if you determine that it was not 11:06:01

17 hydraulically connected to the aquifer from which 11:06:13

18 you're analyzing, would you use the information from 11:06:15

19 that well? 11:06:17

20 A Well, yes. 11:06:19

21 Q And what would you use the information from 11:06:19

22 that well for? 11:06:23

23 A What information are you referring to, 11:06:23

24 Mr. Gee? 11:06:26

25 Q Let's say that you -- 11:06:26

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1 located two miles away from the pumping well and 11:07:53  
2 you've made a determination that it's not 11:07:57  
3 hydrogeologically connected. 11:08:00  
4 Would you use that information from the 11:08:02  
5 well that's not hydrogeologically connected to the 11:08:04  
6 pumping well to make a determination as to the 11:08:08  
7 source of contamination in the aquifer from which 11:08:12  
8 the pumping well was drawn? 11:08:15  
9 A That was a long question. There's a 11:08:17  
10 possibility, given your hypothetical, that that data 11:08:28  
11 from that well could still tell you something about 11:08:31  
12 the contamination in that area, yes. 11:08:36  
13 Q What -- what information was -- what 11:08:38  
14 information was -- 11:08:41  
15 A It depends on the -- 11:08:44  
16 THE REPORTER: One at a time. One at a 11:08:44  
17 time. 11:08:45  
18 THE WITNESS: Sorry. My apologies. 11:08:45  
19 Contamination moves and if -- if you know 11:08:49  
20 what the concentration of certain chemicals are at 11:08:51  
21 that point and let's say it's not -- that you don't 11:08:56  
22 think it's hydraulically connected, that data could 11:09:00  
23 still tell you about the aquifer and the 11:09:06  
24 characterization of the contamination in that 11:09:08  
25 aquifer, yes, depends on -- on the circumstances. 11:09:10

1 BY MR. GEE: 11:09:13

2 Q And what information would you glean from 11:09:13

3 an unconnected aquifer or unconnected well that you 11:09:20

4 can use in your analysis? What information -- what 11:09:24

5 would you use that information for? 11:09:29

6 A Water quality data or water level data? 11:09:31

7 Q Let's start with water quality data. 11:09:36

8 A Well, if it's -- if it truly in your 11:09:39

9 hypothetical is not connected, that data could still 11:09:44

10 help define the level and extent of contamination in 11:09:48

11 the area. 11:09:52

12 Q Okay. But what about in the aquifer from 11:09:52

13 which a well -- 11:09:56

14 A Yes, in the aquifer, as I testified to 11:09:57

15 earlier, contamination moves with the groundwater. 11:10:00

16 It could tell you where it's moving, what the 11:10:05

17 concentrations are in relation to other wells. 11:10:09

18 Q Okay. So in your expert testimony, you're 11:10:12

19 saying -- is it correct to say that information from 11:10:18

20 a hydraulically disconnected well can be used in 11:10:26

21 your analysis as to fate and transport of 11:10:33

22 contamination in a pumping well that you're trying 11:10:36

23 to characterize in a pump test? 11:10:38

24 A Potentially, yes. 11:10:40

25 Q That's all I'm trying -- that's all -- 11:10:43

1           that's all I need to know. Thank you, sir. 11:10:45

2                   MR. HAGSTROM: Byron, are you ready for a 11:10:54

3           break or at least I know I need a break? 11:10:58

4                   MR. GEE: Okay. Mr. Hagstrom, you're 11:11:00

5           invited to ask for a break, too. 11:11:03

6                   MR. HAGSTROM: Five minutes? 11:11:10

7                   MR. GEE: Five minutes is, yeah, 11:10 -- 11:11:11

8           can we go off the record? 11:11:16

9                   THE VIDEOGRAPHER: Yes, please. Thank you. 11:11:17

10          We're going off the record at 11:11. 11:11:18

11                               (Recess taken.)

12          (Mr. Trowbridge entered the deposition proceedings.) 11:17:19

13                   THE VIDEOGRAPHER: We are now back on the 11:21:14

14          record. The time is 11:21. Please proceed. 11:21:30

15          BY MR. GEE:

16                Q     Mr. Hokkanen, I'd like to proceed to your 11:21:35

17          first opinion and let me read your first opinion for 11:21:37

18          the record. 11:21:42

19                   "The investigation at the Bermite Site 11:21:44

20          determined that perchlorate and VOCs were 11:21:47

21          generally" -- "generally released from the same 11:21:51

22          source areas." 11:21:55

23                   Can you briefly explain the basis of your 11:21:59

24          opinion? 11:22:01

25                A     The opinion is primarily based on the 11:22:05

1 remedial investigations conducted at the site. I 11:22:09  
2 believe they're summarized in a CD -- 11:22:15  
3 THE REPORTER: I'm sorry, sir. You cut  
4 out.  
5 THE WITNESS: Sorry. The information 11:22:30  
6 collected for the different source areas was 11:22:31  
7 reported on in a report by CDM. It's a remedial 11:22:35  
8 investigation report for the Bermite site. 11:22:40  
9 BY MR. GEE: 11:22:42  
10 Q Mr. Hokkanen, did you do any independent 11:22:42  
11 analysis to confirm what you read? 11:22:49  
12 A Did I collect samples? 11:22:54  
13 Q No. Did you do any analysis to confirm 11:22:57  
14 what you read, independent data analysis or 11:22:59  
15 whatever? 11:23:04  
16 A No. 11:23:06  
17 Q And why was this opinion -- why was this 11:23:06  
18 opinion important to your -- to Whittaker 11:23:12  
19 Corporation or why did you even -- why is this -- if 11:23:18  
20 I were to try to explain to the jury what this 11:23:29  
21 opinion was about, what would I tell -- how would I 11:23:31  
22 explain why this opinion is relevant? 11:23:39  
23 A Knowing source areas helps in understanding 11:23:41  
24 the water quality data. 11:23:47  
25 Q And can you explain why that is? 11:23:52

1           A       Source areas by definition are areas where       11:23:54  
2                   chemicals enter groundwater, and it helps to       11:24:04  
3                   understand the data that you collect -- quality data   11:24:11  
4                   that you collect for monitoring wells.           11:24:16

5           Q       Now, let me ask you a little bit about the       11:24:20  
6                   scope of your analysis.                   11:24:25

7                   Did you make any type of analysis as to the       11:24:26  
8                   magnitude of the releases from the different source   11:24:30  
9                   areas?                                   11:24:34

10          A       No, and I don't believe anyone has. I'm       11:24:34  
11                   reading the CDM report. I don't believe that's been   11:24:39  
12                   done.                                   11:24:44

13          Q       Okay. Would you find that information       11:24:44  
14                   useful if somebody had done -- had done that       11:24:53  
15                   analysis?                               11:24:56

16          A       I'm sorry. Could you go back? What       11:24:56  
17                   analysis specifically are you referring to?       11:25:00

18          Q       The magnitude of a contamination in each of   11:25:03  
19                   the different source areas that were evaluated.   11:25:06

20          A       In the ideal world, that would be nice       11:25:11  
21                   information to know, yes.                   11:25:14

22          Q       And what would you do with that information   11:25:15  
23                   if you -- if you had that information?       11:25:18

24          A       Again, it would help to understand the       11:25:19  
25                   water quality data downgradient of those source       11:25:29



1 areas. 11:25:34

2 Q Mr. Hokkanen, do you know of which 11:25:34

3 operations resulted in the release of the VOC? 11:25:42

4 A That's not something that I looked at, no. 11:25:47

5 Q Okay. And the same question for 11:25:50

6 perchlorate, did you look to determine what 11:25:55

7 operations that resulted in the release of 11:25:58

8 perchlorate? 11:26:02

9 A No. 11:26:02

10 Q Did you do any analysis to determine when 11:26:04

11 the releases in the source areas occurred? 11:26:13

12 A No. 11:26:15

13 Q Do you know what specific munitions, 11:26:17

14 explosives, or other products that were made in the 11:26:28

15 1930s? 11:26:30

16 A Not really, no. I mean it was mentioned in 11:26:31

17 a few reports that I read, but that was not my 11:26:35

18 focus. 11:26:38

19 Q Okay. And your answer would be the same 11:26:38

20 regardless if I said 1940s, '50s, and '60s? 11:26:41

21 A I don't know. 11:26:46

22 Q You don't know or your answer would be the 11:26:47

23 same that you don't know what happened? 11:26:49

24 A The way you put it, yes, Mr. Gee. 11:26:50

25 Q Okay. And did you review any documents 11:26:57

1           that indicated what type of products were made           11:27:02

2           between 1942 and 1960?           11:27:05

3           A       Not specifically, no. I mean there was           11:27:10

4           again -- that was not my focus. There was some           11:27:12

5           mention in a general way in some of the reports I           11:27:16

6           read, but I don't really know.           11:27:19

7           Q       Okay. Did you look at any records to           11:27:24

8           determine how much TCE was purchased during these           11:27:26

9           time periods?           11:27:30

10          A       I did not look at that, no.           11:27:31

11          Q       Okay. Did you look at any records that           11:27:39

12          would indicate how much TCE was used during this           11:27:41

13          time period?           11:27:45

14          A       No.           11:27:46

15          Q       Did you look at the magnitude of the -- or           11:27:46

16          the levels of contamination in these different areas           11:28:00

17          that you reviewed for which releases occurred?           11:28:04

18          A       In what medium?           11:28:11

19          Q       In soil.           11:28:12

20          A       I did look at the soil data in the CDM           11:28:17

21          report. It wasn't a real big focus of my work, but           11:28:21

22          I read it, and I did look at some of the data, yes.           11:28:26

23          Q       Okay. And when you reviewed the report,           11:28:30

24          did it show high levels of TCE in the burn area           11:28:32

25          before the remedy was implemented?           11:28:38

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1 get me wrong, there's nothing wrong with agreeing. 11:30:15

2 A I understand. 11:30:18

3 Q So is it fair to say that you didn't 11:30:23

4 conduct any kind of analysis as to what the source 11:30:25

5 of the TCE in the burn valley area was? 11:30:28

6 A Not specifically, no. It appeared to be an 11:30:32

7 area of TCE release, how much, and, no, I did no 11:30:36

8 analysis other than that. 11:30:43

9 Q Okay. And to summarize, you didn't do any 11:30:47

10 kind of analysis to determine the source of TCE and 11:30:48

11 perchlorate contamination that impacted the soil; is 11:31:00

12 that correct? 11:31:07

13 A That impacted the soil? 11:31:07

14 Q Yes. You didn't look at the specific 11:31:08

15 operations that led to the TCE/PCE contamination in 11:31:12

16 the soil? 11:31:15

17 A That's correct. 11:31:15

18 Q Let's go back to your expert report which 11:31:17

19 is marked as 314. 11:31:33

20 A I have it up. 11:31:37

21 Q Okay. Can you go to section 4.2.2 -- 11:31:39

22 4.2.2.2, three twos behind it. 11:31:45

23 A 4.2.2.2? 11:31:56

24 Q Yes. 11:31:58

25 A Got it. I'm there. 11:31:58

1 Q In there, you state that the source areas 11:32:00  
2 are primarily locations where perchlorate and VOCs 11:32:05  
3 enter the groundwater. 11:32:10

4 Were there source areas that you looked at 11:32:15  
5 for perchlorate and VOC contamination and the soil 11:32:19  
6 did not enter the groundwater? 11:32:22

7 A I did not make that determination, no. 11:32:24

8 Q And if it didn't enter the groundwater, 11:32:30  
9 where would the contamination go? 11:32:32

10 A Where would it go? Well, I'll speak in a 11:32:37  
11 really general way. If you have releases of a 11:32:41  
12 chemical at the surface and it rains and you have 11:32:44  
13 infiltration from the rainwater, generally those 11:32:49  
14 chemicals will eventually reach the groundwater. 11:32:54

15 Q Okay. Now, Mr. Hokkanen, did you do any 11:32:58  
16 analysis in terms of fate and transport of these 11:33:08  
17 contaminants through the soil meaning how fast they 11:33:13  
18 move, what caused them to move into the groundwater, 11:33:17  
19 where it goes, and how much -- how much of it enters 11:33:22  
20 the groundwater? Did you do any kind of analysis 11:33:25  
21 like that? 11:33:28

22 A No. 11:33:28

23 Q Now, prior to reaching your opinion, what 11:33:28  
24 analysis did you do to -- to -- to arrive at your 11:33:50  
25 first opinion? Other than looking at the CDM 11:33:56

1 report, was there anything else that you did? 11:34:00

2 A That was probably the main -- the main 11:34:02

3 source of that opinion. I also looked at the water 11:34:07

4 quality data that indicated in a general way that 11:34:11

5 there were multiple sources on the Bermite site. 11:34:17

6 Q Okay. Were there any areas where you saw 11:34:20

7 perchlorate contamination and not VOC contamination? 11:34:24

8 A What medium? 11:34:26

9 Q In the soil. 11:34:29

10 A Well, as my opinion stated, generally they 11:34:33

11 were colocated sources. So there were -- the 11:34:38

12 details in the CDM report, there were a few 11:34:42

13 instances where there was either perchlorate and not 11:34:45

14 TCE and vice versa. Generally they were colocated. 11:34:48

15 Q Okay. So that was your opinion number one. 11:34:53

16 We'll move over to opinion number two. 11:35:01

17 Opinion number two, for the record, says 11:35:08

18 that "Perchlorate and VOCs released from the source 11:35:09

19 areas on the Bermite Site followed the same 11:35:14

20 migration pathway in the unsaturated zone and in 11:35:18

21 groundwater." 11:35:22

22 Can you explain to -- can you explain why 11:35:31

23 it helps the reader of your report to understand 11:35:33

24 that VOCs and perchlorate were generally released in 11:35:36

25 the same locations across the Whittaker site? 11:35:39

1           A     That was opinion one. Are we on to opinion     11:35:45  
2                   two now?     11:35:50  
3           Q     Well, I'm trying to figure out if opinion     11:35:50  
4                   two is in any way connected to opinion one.     11:35:53  
5           A     Okay. That wasn't your question. So could     11:35:55  
6                   you repeat your question?     11:36:00  
7           Q     Okay. First, let's try to get to the     11:36:02  
8                   question.     11:36:19  
9                   Let's actually go back to opinion one.     11:36:25  
10          A     Okay.     11:36:29  
11          Q     What conclusions or inferences were you     11:36:29  
12                   able to draw from your analysis that perchlorate and     11:36:32  
13                   VOCs were generally colocated at the     11:36:38  
14                   Whittaker-Bermite site?     11:36:45  
15          A     What conclusions, sir?     11:36:46  
16          Q     Yeah. What -- what conclusions or     11:36:50  
17                   inferences did you -- did you have or did you -- did     11:36:52  
18                   you make based on your first opinion?     11:36:58  
19          A     Well, if the sources on the Bermite site     11:37:03  
20                   generally are colocated, then they -- once they     11:37:06  
21                   reach the groundwater, both perchlorate and the     11:37:11  
22                   VOCs, as opinion two says, they should generally     11:37:14  
23                   follow the same path downgradient migrating with the     11:37:20  
24                   groundwater.     11:37:24  
25                   They should also be in the groundwater     11:37:27

1 generally colocated. If they're from the same 11:37:30  
2 sources and they follow groundwater, if you see 11:37:32  
3 perchlorate, you should see TCE generally speaking. 11:37:35  
4 Q Okay. So, in summary, you're saying that 11:37:40  
5 your second opinion kind of flows -- flows from your 11:37:44  
6 first opinion? 11:37:47  
7 A Yes -- well, they -- if they go together, 11:37:49  
8 yes. The second opinion is a very basic principle 11:37:56  
9 of contaminant transport that dissolved chemicals 11:37:59  
10 flow with the groundwater. 11:38:03  
11 Q Okay. And does the data support your 11:38:04  
12 second opinion that perchlorate and VOCs generally 11:38:15  
13 flow -- follow the same path to the groundwater and 11:38:21  
14 the same path in the groundwater? 11:38:25  
15 A I'd say it does, yes. 11:38:27  
16 Q Now, the next question, not being a 11:38:30  
17 hydrogeologist, there are certain terms that are 11:38:42  
18 used within your report or referred to in your 11:38:46  
19 report that I'd like to try to get a clarification 11:38:49  
20 as to what the distinctions are between the terms. 11:38:52  
21 In some parts of your report, you discuss 11:38:58  
22 migration pathways and in other areas in your 11:39:01  
23 report, you discuss plausible pathways. 11:39:06  
24 What is -- what is the difference between 11:39:11  
25 the two? 11:39:12



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1 hypothesis. It's a hypothetical pathway. 11:41:07

2 Q And as I recall -- let me -- let me ask a 11:41:19

3 question that counsel asked at the deposition, but 11:41:40

4 let me change the terms a little bit. 11:41:42

5 Can you -- can you say with a degree of 11:41:45

6 scientific certainty that a plausible pathway is 11:41:47

7 actually occurring or is an act -- that a plausible 11:41:50

8 pathway actually depicts the groundwater flow? 11:41:55

9 MR. HAGSTROM: I'm going to object. It's 11:42:03

10 vague. 11:42:04

11 But go ahead, Mr. Hokkanen. 11:42:05

12 THE WITNESS: It depends on what data you 11:42:13

13 have. I mean a hypothetical pathway with no data to 11:42:16

14 support it is not a plausible pathway. 11:42:19

15 The definition that I gave you as a 11:42:21

16 plausible pathway is one that you have some data to 11:42:23

17 suggest there is a pathway, but you're not certain 11:42:24

18 about it. It's plausible. It's possible. 11:42:30

19 BY MR. GEE: 11:42:33

20 Q Okay. And what data did you look at to 11:42:33

21 establish a plausible pathway? 11:42:38

22 A Generally a combination of water level data 11:42:45

23 and water quality data. 11:42:48

24 Q I'm sorry, Mr. Hokkanen. Something going 11:42:53

25 on with the video where, you know, like your answer 11:42:55

1 is kind of a little bit choppy. 11:42:57

2 Can you repeat your answer? 11:43:01

3 A Your questions are sort of the same way. 11:43:02

4 Some of the time when it's a little choppy. I'll 11:43:06

5 repeat my answer. 11:43:08

6 Well, why don't we go back. Can you repeat 11:43:13

7 the question, sir? 11:43:13

8 MR. GEE: You know, it's been so long, 11:43:14

9 Linda, can you repeat the question. 11:43:17

10 THE WITNESS: I lost my train of thought. 11:43:18

11 MR. GEE: So did I. 11:43:22

12 THE REPORTER: Let me see if I can find it. 11:43:23

13 (The record was read as follows:

14 "Q And what data did you look at

15 to establish a plausible pathway?")

16 THE WITNESS: It would be a combination of 11:43:39

17 water level data and water quality data. 11:43:40

18 BY MR. GEE: 11:43:46

19 Q Would groundwater pumping from monitoring 11:43:46

20 production wells impact groundwater pathways? 11:43:54

21 A Yes, it would impact -- would impact the 11:43:58

22 water levels and where groundwater is flowing, yes, 11:44:04

23 but you make that determination based on the water 11:44:10

24 levels essentially because it will impact water 11:44:14

25 levels. 11:44:16

1 Q Okay. And has it impacted water levels? 11:44:17

2 Has groundwater pumping impacted water levels? 11:44:22

3 A Generally speaking, it will lower water 11:44:25

4 levels. 11:44:27

5 Q Well, there's another term that shows up in 11:44:27

6 your report called conceptual migration pathways. 11:44:52

7 Is that -- what is that as -- as compared 11:44:54

8 to the term, for example, plausible pathway, what is 11:44:58

9 the difference? 11:45:02

10 A Can you tell me where you're seeing that in 11:45:02

11 my report, sir? I'm asking because I'm not 11:45:05

12 remembering that particular phrase. 11:45:17

13 Q I should have wrote it down. Have you ever 11:45:22

14 heard of the term "conceptual migration pathway"? 11:45:32

15 A In a general sense, yes. I mean it's -- 11:45:39

16 conceptual is -- conceptual, again, is related to -- 11:45:49

17 I think I remember where this is in my expert 11:45:55

18 report, sir. 11:45:58

19 Q Yeah. If you go to page -- you're actually 11:45:58

20 quoting the CH2M Hill report on the -- let's go -- 11:46:02

21 let's use the PDF page. PDF page 15 on your report. 11:46:09

22 A Got it, thank you. 11:46:13

23 Q And the first -- first full paragraph, 11:46:14

24 first sentence. 11:46:17

25 A Yes. Okay. What was your question, sir? 11:46:23

1 Q What did that term mean to you "conceptual 11:46:25  
2 migration pathways"? 11:46:32

3 A Well, that was a term that CH2M Hill 11:46:33  
4 specifically used. That's why I have it in quotes, 11:46:36  
5 and I believe Mr. Lechler defined them as  
6 hypothetical pathways because he wrote the report. 11:46:44

7 Q And when you read the report, did you -- 11:46:46  
8 did you determine whether there was no basis for the 11:46:58  
9 pathways that he -- that he postulated? 11:47:00

10 A Are they plausible pathways or are they 11:47:06  
11 actual pathways? 11:47:10

12 Q No. When you read his report, did he 11:47:12  
13 provide any information or any kind of rationale for 11:47:15  
14 selecting the pathways -- 11:47:24

15 THE REPORTER: I'm sorry. Any kind of 11:47:24  
16 what? I'm sorry. Any kind of what? 11:47:26

17 BY MR. GEE:

18 Q -- rationale as to why the conceptual 11:47:27  
19 migration -- why he chose the conceptual migration 11:47:33  
20 pathways? 11:47:36

21 A From memory, I don't believe he provided 11:47:42  
22 much information to support the pathways. He was 11:47:47  
23 proposing those as hypothetical pathways, and I 11:47:51  
24 don't believe there was much information to support 11:47:57  
25 those hypothetical pathways or conceptual migration 11:47:59

1 pathways. 11:48:03

2 Q Okay. Did his -- did his report contain 11:48:04

3 groundwater elevation data? 11:48:09

4 A I believe there are some -- there is some 11:48:12

5 data, yes. 11:48:19

6 Q And did his report contain data regarding 11:48:20

7 contamination in different wells? 11:48:26

8 A He didn't actually provide data. I believe 11:48:30

9 he provided -- provided colored dots. 11:48:34

10 Q That's data, isn't it? 11:48:35

11 A It doesn't tell me a lot. 11:48:38

12 Q Well, where did the color dots come from? 11:48:42

13 A He -- he -- apparently it's the data, but 11:48:46

14 there was -- your question was did he provide data 11:48:49

15 in his report. I don't believe he did. 11:48:51

16 Q Okay. And I don't recall either, but it 11:48:54

17 was a pretty long report with a lot of tables and a 11:48:59

18 lot of different things. 11:49:04

19 A I don't remember that he -- I mean I -- 11:49:04

20 there appears that in the report it shows detections 11:49:09

21 in wells for different -- for different chemicals, 11:49:14

22 but data wasn't provided. I believe it was colored 11:49:17

23 dots. We don't really know what depth and -- and 11:49:22

24 when or anything. So there was -- there were 11:49:27

25 colored dots. 11:49:32

1 Q Okay. But he did present information that 11:49:33  
2 you testified would be information that you would 11:49:42  
3 consider in determining whether there's a plausible 11:49:47  
4 pathway, is it not? You mentioned groundwater 11:49:50  
5 elevation and some contamination data or -- is that 11:49:54  
6 correct? 11:49:58  
7 MR. HAGSTROM: Objection; mischaracterizes 11:49:58  
8 his testimony. 11:50:01  
9 Go ahead, Mr. Hokkanen. 11:50:02  
10 THE WITNESS: He did provide some 11:50:03  
11 information, that's correct. 11:50:05  
12 BY MR. GEE: 11:50:09  
13 Q So it is possible that his hypothetical 11:50:09  
14 pathways are not completely baseless; is that 11:50:18  
15 correct? 11:50:22  
16 MR. HAGSTROM: Objection; calls for 11:50:23  
17 speculation. 11:50:24  
18 THE WITNESS: Well, I'll use his 11:50:27  
19 terminology. They're conceptual migration pathways, 11:50:29  
20 and so are they actual pathways, I believe what he 11:50:33  
21 said in the report and in his testimony was that, 11:50:37  
22 no, they're hypothetical, they're conceptual. We 11:50:40  
23 would -- and as a matter of fact, he recommended 11:50:45  
24 data to be collected to see if they were pathways or 11:50:47  
25 not. 11:50:50

1 BY MR. GEE: 11:50:51

2 Q Now, the information -- do you recall 11:50:51

3 specifically what information he was thinking to 11:51:00

4 obtain before to help his analysis? Was it -- was 11:51:07

5 it elevation path -- data or was it contamination 11:51:14

6 data, if you recall? 11:51:20

7 A I believe his focus -- I'm sorry -- focus 11:51:24

8 was on quality data, but if you installed wells, you 11:51:27

9 would collect both water level and water quality 11:51:31

10 data. 11:51:34

11 Q Okay. Let me break down your opinion into 11:51:34

12 the segments by contaminant, for instance. 11:51:55

13 A Which opinion, sir? 11:52:01

14 Q This is opinion number two. I'm still 11:52:04

15 working on opinion number two. 11:52:05

16 A Got it. 11:52:09

17 Q Okay. Is it your opinion -- or is it your 11:52:10

18 opinion that there is a migration pathway for 11:52:12

19 perchlorate released at the site into the 11:52:18

20 groundwater through the unsaturated zone? 11:52:22

21 A To get to the groundwater, it would need to 11:52:32

22 move to the unsaturated zone by definition, yes. 11:52:34

23 Q I'm just -- I'm just pretending -- I'm 11:52:35

24 trying to explain this to a jury, and the jury is 11:52:40

25 not going to be hydrogeologists. 11:52:42



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1 Everybody uses the term "pathway." Chemicals 11:54:09  
2 dissolved in groundwater at the Bermite site don't 11:54:13  
3 move along the line. 11:54:16

4 As you can see from the perchlorate data, 11:54:19  
5 perchlorate has developed a very large area of 11:54:24  
6 impact, and as I testified to earlier, based on the 11:54:26  
7 water quality data, it appears that perchlorate -- 11:54:31  
8 perchlorate plume from the Bermite site is about a 11:54:35  
9 mile wide. 11:54:38

10 So we have a pretty large wide plume, and 11:54:39  
11 my point is there's not a line -- there's not one 11:54:44  
12 pathway. There's a general direction that chemicals 11:54:47  
13 released from the Bermite site have migrated 11:54:50  
14 downgradient. 11:54:55

15 Q Okay. And perhaps that's why I asked the 11:55:01  
16 question about different pathway terms is because 11:55:05  
17 that's not a well-understood concept for us 11:55:10  
18 non-hydrogeologists. 11:55:14

19 Is it your opinion that there is a 11:55:18  
20 groundwater migration pathway for VOCs to travel 11:55:20  
21 from the Whittaker-Bermite site to Santa Clarita 11:55:26  
22 Valley Water Agency's production wells? 11:55:31

23 A Is there a pathway for VOCs to migrate? 11:55:34  
24 VOCs based on my review of the water quality data, 11:55:38  
25 one, is -- we talk about this at length in my expert 11:55:44

1 report -- there are VOCs in groundwater beneath the 11:55:48  
2 Whittaker site and, two, they are migrating in a 11:55:52  
3 downgradient direction with the groundwater. 11:55:55  
4 And based on my review of the data, they 11:55:59  
5 have not migrated yet to the water agency production 11:56:03  
6 wells. 11:56:08  
7 Q And that's -- we'll get to migration rates 11:56:15  
8 later, but for now I think we're talking about 11:56:17  
9 plausible pathways. 11:56:20  
10 Would VOCs flow in the same general 11:56:23  
11 direction and along the same pathways -- and, again, 11:56:26  
12 let's leave the retardation factor out for now -- as 11:56:33  
13 perchlorate? 11:56:38  
14 A That was my second opinion, yes. 11:56:39  
15 Q Now, this gets a little bit into the 11:56:41  
16 merging of your first and second opinion. 11:57:11  
17 Would you agree that because perchlorate 11:57:15  
18 and VOC contamination were released at different 11:57:18  
19 source areas throughout the Whittaker-Bermite site, 11:57:23  
20 that each of the different source area releases 11:57:27  
21 would have different migration pathways toward the 11:57:30  
22 Santa Clarita Valley Water Agency's production well? 11:57:36  
23 MR. HAGSTROM: Object. That 11:57:41  
24 mischaracterizes his testimony. 11:57:42  
25 THE WITNESS: Not -- not -- let me -- let 11:57:51

1 me answer it this way. As I've testified to 11:57:52  
2 earlier, there aren't -- well, as I testified about 11:57:55  
3 what a -- the pathway from the Bermite site 11:58:03  
4 downgradient is, there aren't specific individual 11:58:07  
5 pathways, and there's several reasons for that. And 11:58:11  
6 I'll get back to your question in just a second, if 11:58:15  
7 that's okay. 11:58:18

8 The reason we -- as I testified to earlier, 11:58:21  
9 we see a very wide perchlorate plume, and there's -- 11:58:24  
10 there are several reasons that that perchlorate 11:58:31  
11 plume is as wide as it is, one of which has to do 11:58:34  
12 with, I'm sure you've seen the term "dispersion." 11:58:37  
13 As contaminants migrate downgradient, they tend to 11:58:41  
14 spread out laterally and horizontally. 11:58:45

15 And, secondly, a very important 11:58:48  
16 consideration at the Bermite site is that the 11:58:51  
17 groundwater flow directions change season to season, 11:58:54  
18 year to year. 11:58:58

19 So -- so, for example, it may be migrating 11:58:59  
20 straight to the northwest and then it moves a little 11:59:05  
21 bit more to the north and then a little bit to the 11:59:08  
22 west, and as these changes in groundwater flow 11:59:11  
23 directions occur, it tends to spread out the plume 11:59:14  
24 in a lateral direction. 11:59:18

25 Getting back to your question, yes, these 11:59:23

1 chemicals from different source areas could start 11:59:26  
2 out moving downgradient along a path that is 11:59:29  
3 somewhat different. As -- as it moves further and 11:59:35  
4 further downgradient, these paths tend to merge. 11:59:38  
5 BY MR. GEE: 11:59:45  
6 Q Okay. That was a lot, Mr. Hokkanen. So 11:59:45  
7 let me see if I can break that down a little bit. 11:59:48  
8 A Yeah, I'm sorry for the long answer, but 11:59:50  
9 it's an important -- it's an important principle for 11:59:52  
10 your question. 11:59:55  
11 Q Okay. You mentioned different influences 11:59:57  
12 over time with regards to perchlorate -- the 12:00:03  
13 migration of perchlorate contamination. 12:00:07  
14 Would those same influences impact VOC -- 12:00:09  
15 the spread of VOC contamination in terms of 12:00:15  
16 migration pathways? 12:00:18  
17 A Yes. In a general way, yes, they would, 12:00:20  
18 yes. 12:00:25  
19 Q And it brings up a good point. I mean 12:00:25  
20 there was a time period, let's say, before 1988 when 12:00:30  
21 the -- a lot of the Saugus Formation wells were 12:00:36  
22 installed where -- where the migration pathway is 12:00:39  
23 different than after the wells were installed. 12:00:45  
24 Would you agree with that in terms of the 12:00:48  
25 wells having an influence on migration pathways? 12:00:52

1           A     The pumping of the wells would have           12:00:59  
2           impacted where groundwater is flowing, yes.           12:01:01  
3           Q     Okay. So would it be true to say that the           12:01:03  
4           groundwater flow from before the wells were           12:01:06  
5           installed differed from the groundwater pathways --           12:01:09  
6           flow pathways after the pump or the well pumps were           12:01:15  
7           installed and operated?           12:01:21  
8           MR. HAGSTROM: Calls for speculation.           12:01:22  
9           But go ahead.           12:01:24  
10          THE WITNESS: And as I just testified,           12:01:26  
11          pumping starting in a large capacity production well           12:01:28  
12          would impact groundwater flow directions, yes.           12:01:34  
13          BY MR. GEE:           12:01:37  
14          Q     Okay. And did you -- did you conduct any           12:01:37  
15          analysis of the impact -- of the operation -- the           12:01:39  
16          Saugus operation of the production wells on           12:01:46  
17          groundwater flow?           12:01:48  
18          A     The specific impact of starting which           12:01:49  
19          wells?           12:01:52  
20          Q     Well, let's say Saugus-1 and Saugus-2.           12:01:52  
21          A     You know, not in the sense of analysis, but           12:01:59  
22          the capture zones that were modeled by the various           12:02:02  
23          investigators lent some light on what the impact           12:02:04  
24          pumping those wells had.           12:02:09  
25          Q     Okay. And you're aware there are similar           12:02:11

1 other Saugus Formation pumping wells other than 12:02:19

2 Saugus-1 and Saugus-2; is that correct? 12:02:21

3 A Yes. 12:02:23

4 Q And during the time period from -- I think 12:02:26

5 it was 1997 to around 2010 or to 2011, are you aware 12:02:29

6 of the Saugus-1 and Saugus-2 wells were not 12:02:35

7 operating? 12:02:40

8 A Yes, I am. 12:02:41

9 Q Okay. And would the operation of the other 12:02:46

10 Saugus Formation wells in the absence of Saugus-1 12:02:48

11 and Saugus-2 operation create an even different 12:02:53

12 pathway for contaminants to flow? 12:02:58

13 A In a general way, yes, shutting off 12:03:03

14 Saugus-1 and 2, again, would have changed the 12:03:06

15 groundwater flow directions, yes. 12:03:09

16 Q And have you conducted any analysis on the 12:03:11

17 impact of operating the other Saugus Formation wells 12:03:16

18 without Saugus-1 and 2 as to how that type of 12:03:21

19 operation would impact groundwater flow? 12:03:25

20 A No. 12:03:30

21 Q Let's see. In your report in section 12:03:30

22 4.2.2.1, you discuss faults and I'm not going to 12:03:41

23 cite to specific language in your report, but you do 12:03:47

24 address faults in your report, don't you? 12:03:52

25 A To a small extent, I just -- I mention the 12:03:54

1 faults, yes. 12:04:02

2 Q Okay. And the two faults that you mention 12:04:02

3 is the San Gabriel fault and the -- is it Holser 12:04:07

4 fault? 12:04:13

5 A Holser fault, yes. 12:04:13

6 Q What is the importance of the San Gabriel 12:04:15

7 fault in your opinion? 12:04:20

8 A Based on quite a bit of study and the 12:04:27

9 reports that I read, the San Gabriel fault acts as a 12:04:29

10 groundwater barrier in the Saugus Formation. 12:04:35

11 Q Okay. And when you say acts as a barrier, 12:04:37

12 in what direction does it act as a barrier? And 12:04:50

13 when I ask that question, I -- I -- I'm not 12:04:56

14 particularly asking whether north or south, but are 12:05:00

15 you talking about acts as a groundwater barrier for 12:05:03

16 groundwater that is perpendicular to the fault, 12:05:09

17 parallel to the fault, or in any particular 12:05:13

18 direction? To what extent is the fault and the 12:05:17

19 barrier and in what direction? 12:05:19

20 A Well, generally a barrier such as the San 12:05:21

21 Gabriel fault means that groundwater doesn't flow 12:05:28

22 across the fault. 12:05:31

23 Q Okay. And in a lot of the drawings I've 12:05:36

24 seen, a fault is represented by a series of dotted 12:05:43

25 lines. 12:05:46



1 Is the direction of the dotted lines 12:05:47  
2 generally interpreted as being the direction of the 12:05:50  
3 fault? 12:05:53  
4 A The dotted lines indicate a -- where the 12:05:56  
5 fault is on a plan or a scale, where the fault is. 12:06:00  
6 Q Okay. But if you see a long -- a long dash 12:06:06  
7 line hypothetically going just east to west, I know 12:06:11  
8 that the San Gabriel fault does have curvature to 12:06:14  
9 it, does that represent that the fault line runs -- 12:06:18  
10 or the fault line runs east to west -- or the fault 12:06:22  
11 lines run from east to west? 12:06:26  
12 A What that line you're referring to 12:06:28  
13 represents is the location of the fault. 12:06:31  
14 Q Okay. 12:06:35  
15 A It runs east/west. Well, if the line is 12:06:36  
16 east/west, the location of the fault is along an 12:06:40  
17 east/west path if that's what you mean. 12:06:44  
18 Q Okay. Just so I understand, let's 12:06:46  
19 hypothetically say that the San Gabriel fault runs 12:06:54  
20 due east and due west. 12:06:56  
21 The ground -- the impact on groundwater 12:06:58  
22 flow, would that be groundwater flow perpendicular 12:07:02  
23 to the east/west fault meaning that groundwater from 12:07:08  
24 the north will migrate south or is it more 12:07:10  
25 complicated than that? 12:07:13

1           A     It simply means that groundwater doesn't     12:07:14  
2     flow across that San Gabriel flow boundary.   So you     12:07:19  
3     have -- whichever way it's flowing, it doesn't flow     12:07:24  
4     across it.   12:07:29

5           Q     Okay.   And on what side of the fault is the     12:07:30  
6     water elevation higher than the other side?   Is it     12:07:36  
7     north of the fault?   Is it higher than south of the     12:07:38  
8     fault or -- I don't recall seeing exactly --     12:07:40

9           A     I don't recall either.   I know that there's     12:07:44  
10    a very large difference in water levels across the     12:07:48  
11    fault which is really why hydrogeologists have made     12:07:54  
12    the determination that it acts as a barrier.     12:07:58

13          Q     Okay.   Now, let me ask about the     12:08:04  
14    characteristics of a fault.                             12:08:22

15                Has anybody characterized the fault in     12:08:25  
16    terms of what happens to contamination that is     12:08:27  
17    spilled right on the fault line or right into the     12:08:33  
18    fault?   Does it move faster or slower?   Does it move     12:08:37  
19    east/west?   Does it have any particular direction --     12:08:40  
20    you indicate that the fault acts as a barrier, but I     12:08:46  
21    saw a lot of different parallel lines so I     12:08:49  
22    presume --   12:08:54

23                THE REPORTER:   I'm sorry.   I saw a lot of     12:08:54  
24    different what?   12:08:56

25                MR. GEE:   Parallel lines.                   12:08:57

1 Q Do we know anything about how groundwater 12:09:02  
2 and contamination migrate between the parallel line 12:09:05  
3 representations of the fault? 12:09:09

4 A I have to apologize, Mr. Gee. I have no 12:09:14  
5 idea what that question meant. Could you repeat 12:09:16  
6 that or break it into parts? 12:09:20

7 Q Okay. We know that -- according to your 12:09:21  
8 observation in other reports, the fault itself acts 12:09:28  
9 as a barrier to groundwater from one side of the 12:09:33  
10 fault to the other. 12:09:39

11 However, if we take a look at the fault 12:09:40  
12 itself -- well, let me -- let me start off with a 12:09:43  
13 different question. 12:09:48

14 What -- what -- from a hydro -- 12:09:49  
15 hydrogeological standpoint, how do you define what a 12:09:52  
16 fault is? 12:09:55

17 A A fault is not a hydrogeologic term. It's 12:09:56  
18 a geologic term. 12:10:02

19 Q Okay. Let's -- you'll have to excuse my 12:10:03  
20 ignorance -- 12:10:07

21 A No, that's okay, but there is a difference 12:10:07  
22 in my world. 12:10:10

23 Q Okay. 12:10:11

24 A I mean a fault is a physical geologic 12:10:11  
25 phenomenon. Hydrogeology has to do with the 12:10:19

1 movement of groundwater in the ground or 12:10:23  
2 groundwater. 12:10:27  
3 Q Okay. 12:10:28  
4 A Where the fault comes into play as 12:10:28  
5 groundwater encounters different -- different 12:10:30  
6 characteristics in the subsurface, in this case a 12:10:35  
7 fault, groundwater will respond to that, and for the 12:10:40  
8 San Gabriel fault, the determination has been after 12:10:44  
9 a lot of study by a number of folks, that 12:10:48  
10 groundwater doesn't move across that fault. 12:10:50  
11 Q Okay. Now, what is the geological 12:10:54  
12 definition of a fault? 12:11:00  
13 A Geologic definition? 12:11:02  
14 Q Yeah, I'm just -- I'm doing Jury Basics 12:11:05  
15 101. 12:11:09  
16 A Well, there's different types of faults. 12:11:09  
17 In this particular case, it's where the -- where -- 12:11:12  
18 where faults occur within consolidated material, and 12:11:16  
19 what I mean by that is rocks, for example. 12:11:20  
20 And you have -- essentially a fault is a 12:11:23  
21 break in the rocks of some kind where there's been a 12:11:26  
22 displacement either horizontally or vertically in 12:11:29  
23 a -- in a formation such as the Saugus. 12:11:34  
24 Q Okay. Do you know if anybody has done any 12:11:39  
25 studies about hydrogeological characteristics in the 12:11:46

1 fault meaning between the broken lines or the broken 12:11:49  
2 rocks and in that general area? 12:11:53  
3 A In that area, not that I'm aware of, no. 12:11:56  
4 Q Okay. So we wouldn't know whether or not 12:12:00  
5 if we had contamination that was released right on 12:12:04  
6 top of the fault, whether that would migrate -- how 12:12:08  
7 or why that would migrate down to groundwater in 12:12:11  
8 that area? 12:12:15  
9 A Well, I'll get back to the -- what we 12:12:15  
10 talked about just previously is that the fault acts 12:12:20  
11 as hydraulic -- 12:12:25  
12 THE REPORTER: Hydraulic what? 12:12:31  
13 THE WITNESS: I apologize. Where did you 12:12:32  
14 leave off? 12:12:35  
15 THE REPORTER: "The fault acts as  
16 hydraulic."  
17 THE WITNESS: Barrier, so groundwater 12:12:40  
18 doesn't flow across the fold. 12:12:44  
19 BY MR. GEE: 12:12:47  
20 Q Okay. But my question is is that the fault 12:12:47  
21 has a certain length, right, because they're broken 12:12:58  
22 rocks or broken whatever, what happens -- 12:13:01  
23 A There's discontinuity in the Saugus 12:13:04  
24 Formation is what it is. 12:13:08  
25 Q Okay. Do you know what happens if we -- if 12:13:09

1 waste is released on top of the fault, not to one 12:13:13

2 side or the other, but right on top of the fault, do 12:13:19

3 we -- do we know what happens there? 12:13:21

4 A I haven't looked at that, Mr. Gee. I 12:13:23

5 apologize. 12:13:28

6 Q No apologize -- no apologies. I couldn't 12:13:28

7 find -- 12:13:31

8 A I don't know. 12:13:31

9 Q I couldn't find any information on that 12:13:32

10 either. 12:13:34

11 Now, is it theoretically possible that a 12:14:12

12 fault can actually act as a conduit for vertical 12:14:15

13 groundwater migration flow? 12:14:23

14 A I don't know the answer to that question. 12:14:30

15 I don't know. 12:14:31

16 Q Is it possible -- it's not well studied, 12:14:31

17 but based on your knowledge and experience, does 12:14:34

18 it -- 12:14:38

19 A I have not encountered that situation. 12:14:39

20 Q Mr. Hokkanen, I looked -- and I did a 12:14:41

21 little bit of homework, and I couldn't find much 12:14:55

22 information on the Holser fault. 12:14:57

23 Did you study the impact of the Holser 12:15:00

24 fault on migration pathways? 12:15:05

25 A The SIC site, which the Holser fault runs 12:15:14

1 right under, according to the geologic maps, there 12:15:19  
2 was some information that they generated. 12:15:22  
3 Generally it appeared that the Holser fault 12:15:25  
4 was not a barrier to hydraulic communication and 12:15:27  
5 what impact it had on migration, I really didn't 12:15:35  
6 determine. 12:15:38  
7 Q Okay. Do you know of any studies that were 12:15:39  
8 done on the fault? 12:15:42  
9 A On the Holser fault? 12:15:43  
10 Q Yeah. 12:15:46  
11 A Not specifically, no. The Holser fault 12:15:47  
12 appears to be -- it's a -- what a geologist would 12:15:49  
13 call sort of a minor off-shoot from the San Gabriel 12:15:54  
14 fault. 12:15:59  
15 So the study has been on the San Gabriel 12:16:00  
16 fault and not -- the Holser has been mapped. I know 12:16:04  
17 generally where it is, but not a lot of study on 12:16:07  
18 that fault to my understanding. 12:16:09  
19 Q Okay. When you say it's an off-shoot, does 12:16:10  
20 that mean that theoretically it could potentially be 12:16:15  
21 a lesser part of the San Gabriel fault? I just 12:16:18  
22 don't know the geology terms. 12:16:21  
23 A It could be -- somebody coughed -- it could 12:16:26  
24 be part of the San Gabriel fault. 12:16:28  
25 Q Yeah, it could be just a -- it could be 12:16:30

1 related to the San Gabriel fault in some manner? 12:16:32

2 A Oh, it is related. That is -- that area 12:16:36

3 is -- there's a fault zone where the earth has been 12:16:40

4 displaced, and the Holser fault is part of that 12:16:44

5 consequence of that faulting in that area, that 12:16:51

6 created a separate off-shoot fault called the Holser 12:16:53

7 fault. 12:16:57

8 Q Okay. So is it -- did you do any kind of 12:16:58

9 evaluation on the Holser fault and its impact on 12:17:03

10 groundwater? I think -- 12:17:07

11 A Generally not --

12 THE REPORTER: I'm sorry. What was the

13 objection? Hold on. Hold on. Hold on. What's the

14 objection?

15 MR. GEE: I'm sorry.

16 THE REPORTER: I'm still trying to figure 12:17:16

17 out what the objection is. 12:17:18

18 MR. GEE: Oh, I'm sorry. 12:17:20

19 MR. HAGSTROM: There wasn't an objection. 12:17:20

20 THE REPORTER: Okay. So people were just 12:17:25

21 talking all over each other, okay. 12:17:25

22 BY MR. GEE: 12:17:27

23 Q Okay. Mr. Hokkanen, you say that the 12:17:34

24 Holser fault runs beneath the SIC site. 12:17:40

25 Do we know anything about the Holser fault 12:17:49



1 in that area? You might have answered that question 12:17:53  
2 already. 12:17:55  
3 A Based on my review of the documents, I 12:17:58  
4 think just the presence of the fault beyond that, 12:18:01  
5 not much. 12:18:05  
6 Q Okay. All right. Let's move on to your 12:18:11  
7 third opinion. 12:18:13  
8 Your third opinion is "Due" -- for the 12:18:20  
9 record, "Due to the different migration rates of 12:18:23  
10 perchlorate and VOCs in groundwater, releases of 12:18:25  
11 perchlorate from the source areas have migrated 12:18:29  
12 faster and further than VOCs." 12:18:33  
13 Did I read that correctly? 12:18:36  
14 A I believe so, yes. 12:18:39  
15 Q Okay. Can you turn to section 4.1.2.1 of 12:18:40  
16 your report. 12:18:53  
17 MR. HAGSTROM: Byron, can you give us the 12:18:57  
18 PDF page? 12:19:00  
19 MR. GEE: I'm trying -- I'm trying to go to 12:19:01  
20 it now. 12:19:03  
21 MR. HAGSTROM: 4.1, I -- 12:19:06  
22 MR. GEE: Let's see. This would be 12:19:11  
23 starting on PDF page 11. 12:19:13  
24 Q The title of the section is "Impact to 12:19:24  
25 Groundwater Production Wells." 12:19:27

1 Do you see that, Mr. Hokkanen? 12:19:29

2 A Yep. 12:19:30

3 Q Okay. Start with perchlorate, you provide 12:19:31

4 a brief history of perchlorate contamination 12:19:44

5 detection. 12:19:47

6 Looking at the Saugus Formation, generally 12:19:49

7 what direction does the perchlorate plume extend? I 12:19:53

8 hear -- I hear the term west south -- west northwest 12:20:00

9 used quite frequently. 12:20:06

10 Is that generally the direction of the 12:20:07

11 perchlorate plume? 12:20:09

12 A Yes, based on water colony data, it's west 12:20:13

13 to northwest, that's correct. 12:20:16

14 Q Okay. And your discussion in 4.1.2.1 also 12:20:20

15 discuss the four impacted Saugus Formation wells in 12:20:26

16 the VOC section. 12:20:30

17 Do you see that? 12:20:32

18 A Yes. 12:20:32

19 Q And is it your understanding that these are 12:20:35

20 the VOC-impacted wells in this litigation? 12:20:38

21 A Which wells are you referring to? Let's be 12:20:43

22 specific. 12:20:46

23 Q Okay. There are only four wells listed 12:20:46

24 here. I think it's Saugus-1, Saugus-2, V-201, and 12:20:49

25 V-205? 12:20:53

1 A Yes. 12:21:01

2 Q There's another well that's identified, but 12:21:01

3 that's Q-2, and I believe that's in the alluvial 12:21:03

4 aquifer; is that correct? 12:21:07

5 A That's correct. 12:21:09

6 Q And is it your understanding that the four 12:21:10

7 Saugus Formation wells that have VOC impacts are the 12:21:19

8 subject of this litigation? 12:21:24

9 A At the perchlorate impact? 12:21:28

10 Q No, the VOC impacts. 12:21:30

11 A Yes. 12:21:36

12 Q Okay. Of the four wells that you describe 12:21:36

13 here, which well is closest to the Whittaker-Bermite 12:21:39

14 site? 12:21:44

15 A Saugus-2. 12:21:44

16 Q Okay. And which is the next closest? 12:21:48

17 A Saugus-1. 12:21:50

18 Q And the third closest? 12:21:54

19 A V-201. 12:21:57

20 Q And I presume that means that V-205 is the 12:21:59

21 farthest away? 12:22:03

22 A You would be right. 12:22:03

23 Q Even for us people who are not 12:22:06

24 hydrogeologists can figure that out. 12:22:09

25 You state in this section that Saugus-1 and 12:22:15

1 Saugus-2 had perchlorate detections in 1997; is that 12:22:19  
2 correct? 12:22:22

3 A Yes, that's when I believe perchlorate was 12:22:22  
4 first analyzed. 12:22:27

5 Q Okay. But that was as a result of a new 12:22:31  
6 test being developed; is that correct? We really 12:22:35  
7 don't know that perchlorate impacted those wells 12:22:40  
8 prior to the new test that was being developed in 12:22:42  
9 1997; is that correct? 12:22:45

10 A If you don't analyze for something, you 12:22:46  
11 don't know if it's there. So I think that's a true 12:22:49  
12 statement. 12:22:52

13 Q Okay. Sometimes, you know, I get different 12:22:53  
14 answers from -- than I would expect. 12:22:57

15 So is it true that we don't know whether 12:23:08  
16 the Saugus-1 and Saugus-2 wells were impacted by 12:23:10  
17 perchlorate before 1997? 12:23:14

18 A No, we didn't -- there were apparently no 12:23:17  
19 analysis of perchlorate prior to then, so yes. 12:23:20

20 Q Okay. Now, the next well that was 12:23:23  
21 impacted -- and I'm talking chronologically -- was 12:23:27  
22 well V-201; is that correct? 12:23:33

23 A Yes, I believe well 201 first detected 12:23:35  
24 perchlorate in 2010. 12:23:41

25 Q Okay. And then V-201 -- or the V-205 12:23:45

1 perchlorate detection came after the V-201; is that 12:23:49  
2 correct? 12:23:53  
3 A A couple of years after, yes. 12:23:53  
4 Q Okay. Now, if Whittaker was the source of 12:23:55  
5 perchlorate -- this is a hypothetical -- would you 12:24:01  
6 expect V-201 to be impacted after Saugus-1 and 12:24:07  
7 Saugus-2? 12:24:14  
8 A Yes. 12:24:15  
9 Q And if Whittaker were the site of 12:24:15  
10 perchlorate, would you expect V-205 to be impacted 12:24:18  
11 after V-201? 12:24:24  
12 A Yes. 12:24:33  
13 Q Okay. Now, I know your expert report 12:24:33  
14 concludes VOC contamination found in the wells are 12:24:39  
15 not from the Whittaker-Bermite site. 12:24:43  
16 But let me -- let me say hypothetically -- 12:24:45  
17 let's say that hypothetically it was, and this is 12:24:48  
18 just -- just for sequencing. 12:24:51  
19 If the Whittaker-Bermite site were the 12:24:55  
20 source of VOCs, would VOCs -- well, let's take it 12:24:57  
21 down contaminant by contaminant. 12:25:07  
22 Would you expect PCE to have impacted 12:25:10  
23 Saugus-1 and Saugus-2 and not -- and possibly not 12:25:15  
24 impacted V-201 and V-205? 12:25:23  
25 A When -- I mean in general not contaminated 12:25:29

1 or in sequence? I missed your question. 12:25:33

2 Q All right. Let's take a snapshot. Today 12:25:35

3 if Whittaker were the site -- or was the source of 12:25:40

4 PCE contamination that's impacting these four wells, 12:25:43

5 would you expect PCE to appear in Saugus-1 and 2, 12:25:51

6 but not appear in V-201 and V-205? 12:25:57

7 A Well, in this sequence, say, since Saugus-1 12:26:02

8 and 2 are closer in your hypothetical to the Bermite 12:26:05

9 site, they are, but in your hypothetical, they would 12:26:10

10 migrate to those wells first and then 201 and then 12:26:12

11 205. 12:26:16

12 Q All right. And you say the highest 12:26:27

13 concentration of PCE for Saugus-1 is 1.2 parts per 12:26:29

14 billion and Saugus-2 -- and for Saugus-2 is 12:26:35

15 0.8 parts per billion and below detection levels for 12:26:40

16 V-201 and V-205; is that correct? 12:26:45

17 A Is that -- is that TCE or PCE? 12:26:48

18 Q Right now, I think we're talking about PCE. 12:26:51

19 A PCE, perchlorate? 12:26:54

20 Q Yes. 12:26:58

21 A Yes. Saugus-1 has recently shown 12:26:59

22 perchlorate concentrations, Saugus-2 a lot less, and 12:27:02

23 V-201 and V-205 have not detected PCE. 12:27:07

24 Q Okay. And in my hypothetical, that 12:27:12

25 Whittaker -- the Whittaker-Bermite site was -- is 12:27:15

1 the source of PCE, would that be consistent with the 12:27:18  
2 detection levels in Saugus-1, Saugus-2, V-201, V-205 12:27:22  
3 be consistent with that hypothetical? 12:27:28

4 A As my opinion three states, that PCE 12:27:31  
5 perchlorate -- perchloroethylene, sorry, would 12:27:36  
6 migrate slower than trichloroethylene. Now, the 12:27:44  
7 caveat to that is monitoring wells in the vicinity 12:27:50  
8 of V-201 and V-205 have had detections of 12:27:54  
9 perchloroethylene. 12:28:01

10 Q Okay. I'm working on my hypothetical right 12:28:01  
11 now. 12:28:07

12 A I'm just adding a little reality. 12:28:09

13 Q Reality sometimes is -- is oversold. 12:28:15

14 A Mr. Gee, I mean in my world, I work with 12:28:17  
15 data. I work with a lot of data, and so -- and I 12:28:22  
16 form my opinions based on data, not on 12:28:26  
17 hypotheticals. 12:28:29

18 Q Well, let me ask you this. Is the absence 12:28:29  
19 of PCE at V-201 and V-205 consistent with your 12:28:36  
20 opinion that VOCs move at a slower rate than 12:28:41  
21 perchlorate? 12:28:46

22 A In a general sense, yes, PCE is not seen in 12:28:46  
23 201 and 205. That's what you would expect. You 12:28:51  
24 would expect to see TCE first. 12:28:54

25 Q Now, let's move over to TCE. Now, you 12:28:56

1 indicate that the maximum concentration of TCE was 12:29:04  
2 four parts per billion in Saugus-1, 1.2 parts per 12:29:08  
3 billion in Saugus-2, and approximately 0.9 parts per 12:29:14  
4 billion in V-201 and V-205. 12:29:20

5 Would that profile be consistent with my 12:29:26  
6 hypothetical that the Whittaker-Bermite site is the 12:29:28  
7 source of VOCs? 12:29:32

8 A No. The distances to V-201 and V-205 12:29:37  
9 are -- from memory, Saugus-1 to V-201 is 12:29:44  
10 three-quarters of a mile, and another about half a 12:29:53  
11 mile to V-205. What I would expect is to see 12:29:55  
12 dispersion knock those concentrations down to 12:29:59  
13 basically nondetect. 12:30:03

14 Q Okay. But like if -- in my hypothetical, 12:30:05  
15 would you expect that concentrations in Saugus-1 and 12:30:10  
16 Saugus-2 to be higher than V-201 and V-205 for TCE? 12:30:13

17 A In a very general way in your hypothetical, 12:30:19  
18 yes, because due to dispersion, the downgradient 12:30:24  
19 wells would show lower concentrations, that's 12:30:29  
20 correct. 12:30:31

21 Q Okay. 12:30:31

22 A However, I'm getting beyond your 12:30:32  
23 hypothetical now. There are monitoring wells in the 12:30:34  
24 vicinity of V-201 and V-205 that show TCE 12:30:37  
25 concentrations much higher than are seen in Saugus-1 12:30:42



1 and Saugus-2. 12:30:46

2 Q Are the wells you're talking about called 12:30:51

3 the mall wells? 12:30:55

4 A There are several wells in that vicinity, 12:30:56

5 the library wells, the mall wells, yes, there are a 12:31:01

6 few others. 12:31:05

7 Q I've seen some spreadsheets recently. In 12:31:05

8 the mall wells, isn't there an extremely high 12:31:08

9 detection of perchlorate that is higher than what is 12:31:10

10 found in the Saugus wells and in the V-201 and 12:31:15

11 V-205? 12:31:21

12 A Well, generally speaking, I don't remember 12:31:23

13 the data specifically. There could be, but 12:31:26

14 generally speaking, you're going to see higher 12:31:29

15 concentrations in monitoring wells than you do in a 12:31:31

16 large-capacity production wells due to dilution 12:31:35

17 essentially. 12:31:39

18 Q Okay. And wouldn't that be true for VOCs 12:31:42

19 as well as perchlorate? 12:31:45

20 A Yes. 12:31:46

21 Q So based on that observation, it's 12:31:46

22 plausible that you could have higher VOC readings in 12:31:58

23 the mall well as compared to the production wells? 12:32:02

24 A That would seem usual, yeah. Sorry, Earl. 12:32:06

25 MR. HAGSTROM: It's vague, ambiguous as to 12:32:12

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1 production wells and the Bermite site is not a 01:19:33  
2 source of VOCs detected" -- "VOC detections in the 01:19:36  
3 wells." 01:19:43  
4 Is that -- is that an accurate reading of 01:19:43  
5 your opinion? 01:19:46  
6 A I believe so, yes. 01:19:50  
7 Q Can you briefly explain the basis of your 01:19:51  
8 opinion? 01:19:58  
9 A Briefly, the opinion is primarily based -- 01:19:58  
10 not wholly but primarily based on my examination of 01:20:05  
11 the water quality data collected at the Bermite site 01:20:09  
12 and downgradient of the Bermite site. To a certain 01:20:14  
13 extent, it's based on water levels and groundwater 01:20:18  
14 flow directions, but primarily on water quality 01:20:21  
15 data. 01:20:24  
16 Q Okay. And did you look at anything else 01:20:24  
17 such as groundwater elevation charts and other 01:20:35  
18 groundwater flow information before rendering your 01:20:43  
19 opinion? 01:20:47  
20 A As I just testified, water levels are used 01:20:49  
21 to estimate groundwater flow direction. So, yes, I 01:20:52  
22 did to a certain extent look at that. 01:20:57  
23 Q Okay. Did you do any calculations on -- on 01:20:59  
24 migration rates? 01:21:05  
25 A Migration rates, no, not really. Migration 01:21:08

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1 rates are subject to quite a bit of uncertainty. So 01:21:15  
2 my focus was on what does the water quality data 01:21:18  
3 tell us about the migration of perchlorate and VOCs. 01:21:23  
4 Q And do you plan on doing any further 01:21:26  
5 evaluation on your -- on this opinion? 01:21:30  
6 A If I'm asked to by counsel, I will, but I 01:21:35  
7 haven't been asked to at this point, no. 01:21:38  
8 Q Okay. So far nobody has tasked you to do 01:21:40  
9 so; is that correct? 01:21:46  
10 A I believe, as you know, I did some 01:21:47  
11 rebuttal, but beyond today, for example, I have not 01:21:53  
12 been asked to do anything. 01:21:56  
13 Q Other than looking at groundwater samples, 01:21:59  
14 what other analysis have you done to determine how 01:22:06  
15 far perchlorate travels from the site? 01:22:11  
16 A Well, that's -- that's what I did. As a -- 01:22:16  
17 my technical specialty as a contaminant 01:22:23  
18 hydrogeologist, us Waterloo guys as you mentioned 01:22:26  
19 earlier, that's what we study, and the best way to 01:22:32  
20 determine how far a contaminant has traveled is 01:22:34  
21 with -- if you have water quality data. In this 01:22:39  
22 case, we do have water quality data. 01:22:42  
23 If you don't have water quality data, then 01:22:44  
24 you're -- then you're doing calculations and models 01:22:47  
25 that are subject to quite a bit of uncertainty. 01:22:49

1 Q Okay. Now, you're relying on water quality 01:23:02  
2 data. 01:23:05  
3 How much -- how many -- I think I asked you 01:23:06  
4 this before, but let me qualify the question a 01:23:08  
5 little bit. 01:23:14  
6 How many groundwater -- off-site 01:23:15  
7 groundwater monitoring wells are there within 01:23:17  
8 200 feet of the Whittaker-Bermite site? 01:23:23  
9 A 200 feet? 01:23:26  
10 Q Yeah. 01:23:28  
11 A There are some in the northern alluvial 01:23:29  
12 area. I don't know the exact distances north of 01:23:36  
13 OU-4. There's the CW-01 well mass. I think it's 01:23:40  
14 more than 200 feet and then there are several south 01:23:44  
15 of OU-4. 01:23:47  
16 Q Okay. And the ones south of OU-4, are they 01:23:48  
17 within a couple hundred feet? 01:23:52  
18 A No. 01:23:54  
19 Q So the groundwater monitoring wells that 01:23:54  
20 you're -- that you've reviewed, it's fair to say 01:24:15  
21 that they're not adjacent to the Whittaker-Bermite 01:24:22  
22 site? 01:24:24  
23 MR. HAGSTROM: Objection; vague. 01:24:28  
24 THE WITNESS: I've reviewed wells that are 01:24:33  
25 on the Whittaker-Bermite site and wells that are off 01:24:34

1 the Whittaker-Bermite site. 01:24:37

2 BY MR. GEE: 01:24:39

3 Q And which is -- what -- how close is the 01:24:39

4 closest off-site groundwater monitoring well to the 01:24:42

5 Whittaker-Bermite site? 01:24:49

6 A I think the closest monitoring wells, is 01:24:50

7 that what you're asking? 01:24:57

8 Q Yes. 01:24:58

9 A I think AL-6, which is an alluvial well and 01:24:59

10 then probably the CW-01 well nest in the main part 01:25:04

11 of the Bermite site. And then as I mentioned, there 01:25:10

12 are several wells downgradient or northwest of the 01:25:13

13 northern alluvium area. 01:25:16

14 Q And when you say "northern alluvium area," 01:25:19

15 are you talking about alluvial wells or are you 01:25:22

16 talking about Saugus Formation wells -- monitoring 01:25:24

17 wells? 01:25:28

18 A The off-site wells are all alluvial wells, 01:25:28

19 I believe, in the northern alluvium area off-site. 01:25:35

20 Q Yeah, I was trying to be clear. 01:25:39

21 A Yes, to be clear. 01:25:41

22 Q I'm trying to picture some monitoring wells 01:25:43

23 in my mind. That doesn't match, but okay. 01:25:45

24 In terms of the Saugus Formation wells, 01:25:53

25 which -- how far is the closest Saugus Formation 01:25:57

1 monitoring well from the Whittaker-Bermite site? 01:25:59

2 A Probably the SG1-HSU well mass, there's 01:26:02

3 four wells in that well nest. Those were the wells 01:26:10

4 that are put in proximity to Saugus-1 as what we 01:26:13

5 call century wells. 01:26:18

6 Q Okay. And century wells, even though they 01:26:19

7 can act as monitoring wells, the purpose of those 01:26:25

8 wells is different than monitoring wells, is it not? 01:26:28

9 My understanding of century wells is they're early 01:26:31

10 detection wells for production wells? 01:26:35

11 A Exactly the same, they're monitoring wells. 01:26:38

12 Q Okay. But the purpose is to -- is the 01:26:41

13 purpose of it to determine flow path of -- of 01:26:44

14 contaminants? 01:26:47

15 A The purpose of a century well, when you 01:26:48

16 separate out a century well, is you have wells that 01:26:53

17 are generally upgradient of, in this case, 01:26:57

18 production wells to give you an early indication if 01:27:02

19 contaminants are moving to a production well. 01:27:06

20 Q Okay. Yeah, I think I understood most of 01:27:09

21 that answer, but you frame freezed for -- for a 01:27:21

22 couple seconds there. 01:27:25

23 A Sorry about that. 01:27:26

24 Q Now, you mentioned earlier in your expert 01:27:27

25 opinion -- earlier expert opinions, that VOCs would 01:27:42

1 travel along the same migration pathway as 01:27:47

2 perchlorate. 01:27:50

3 Is that -- is that a fair characterization? 01:27:50

4 A That's my opinion, too, yes. 01:27:53

5 Q Okay. And did you consider all possible 01:27:56

6 perchlorate pathways to your analysis? 01:27:59

7 A Possible. As I described earlier in my 01:28:01

8 testimony, there aren't individual discrete 01:28:08

9 pathways. There's essentially, based on the water 01:28:12

10 quality data, a large pathway that perchlorate from 01:28:15

11 multiple sources have migrated. So that -- as you 01:28:19

12 determine the pathway that I considered, so where 01:28:25

13 perchlorate is moving, generally speaking, that's 01:28:30

14 where TCE -- 01:28:32

15 THE REPORTER: I'm sorry. That's where 01:28:36

16 TCE? 01:28:39

17 THE WITNESS: -- would migrate also. 01:28:42

18 BY MR. GEE: 01:28:43

19 Q Thank you. I didn't hear that either. 01:28:43

20 Did you consider any of the pathways 01:28:57

21 identified by AECOM in their quarterly groundwater 01:28:58

22 monitoring reports? 01:29:04

23 A I don't recall any path -- specific 01:29:10

24 pathways at AECOM that were identified. Maybe you 01:29:11

25 could help me out with that. 01:29:14



1 Q Okay. When I say "pathways," I think we 01:29:15  
2 discussed this a little bit earlier, but the first 01:29:26  
3 thing that you -- that you look at when you consider 01:29:28  
4 pathways is to look at groundwater elevation levels. 01:29:32  
5 And then I think you indicated that after 01:29:38  
6 that, you know, like you take a look at 01:29:40  
7 contamination levels to see if there's contamination 01:29:43  
8 along the different potential pathways. 01:29:49  
9 Is that -- is that pretty -- is that a 01:29:54  
10 summary -- you know, is that -- is that -- is that 01:29:57  
11 how geologists look at potential pathways? 01:30:00  
12 A It's a little more complicated than that. 01:30:04  
13 You generally look at those two together. It's not 01:30:09  
14 like, you know, one, two, you use a combination of 01:30:12  
15 water levels and water quality to try to determine 01:30:17  
16 where -- where contaminants are migrating. 01:30:22  
17 And in my analysis here and in my practice 01:30:26  
18 over the years, if I have water quality data, that 01:30:29  
19 is going to tell me where contaminants have 01:30:34  
20 migrated. As Ms. Stanin put it, you can use 01:30:39  
21 contaminants as tracers over a long period of time 01:30:43  
22 or migration pathways. 01:30:47  
23 Q And migration pathways, were they the same 01:30:56  
24 at the different hydrostatic units? For example, 01:30:59  
25 was a migration pathway in hydrostatic unit S-3a the 01:31:02

1 same migration pathway as it would be for 3c? 01:31:08

2 A There could be some differences, and it 01:31:13

3 looks like based on the data, there are some 01:31:15

4 differences. 01:31:18

5 MR. GEE: Mr. Hokkanen, when it comes up, 01:31:48

6 can you take a look at Exhibit 316. 01:31:50

7 THE WITNESS: All right. 01:32:15

8 (The document referred to was marked by the

9 Reporter as Deposition Exhibit 316 for

10 identification and is attached hereto.)

11 BY MR. GEE: 01:32:15

12 Q Okay. Let's see. For the record, 316 is 01:32:15

13 an AECOM-generated figure for Whittaker Corporation, 01:32:31

14 and it's labeled "Potentiometric Surface Map, Saugus 01:32:42

15 Formation HSU" -- I think it says S-3c; is that -- 01:32:49

16 is that right, Mr. Hokkanen? My vision is not -- 01:32:55

17 A That's what I read also, yeah, 3c. 01:32:58

18 Q Okay. And looking at this drawing, do you 01:33:05

19 see the blue arrows? 01:33:08

20 A Yes. 01:33:11

21 Q And what -- according to the legend, the 01:33:12

22 blue arrows indicate that it is the approximate 01:33:19

23 direction of groundwater flow. 01:33:26

24 Did I read that right? 01:33:28

25 A That's generally what those arrows mean, 01:33:29

1 yes. 01:33:35

2 Q Don't the arrows in HSU-3 appear to be 01:33:35

3 moving to the west southwest -- towards the west 01:33:48

4 southwest direction from the Whittaker-Bermite site? 01:33:54

5 A In May of 2019, based on these water 01:34:02

6 levels, that's what it indicates, yes. 01:34:05

7 Q Okay. And is this consistent with the 01:34:07

8 groundwater flow direction that you have in your 01:34:15

9 opinion?

10 A Which specific groundwater flow direction 01:34:25

11 in my opinion are you referring to, sir? 01:34:28

12 Q I believe that in your opinion, you had 01:34:30

13 groundwater flow directions that moved from OU-3 and 01:34:32

14 OU-4 toward the west three monitoring wells on the 01:34:36

15 west side of OU-4? 01:34:43

16 A I said -- yes, I indicated that over a 01:34:51

17 period of time, that groundwater flows in a west to 01:34:56

18 northwest direction from the Whittaker site, yes. 01:35:02

19 Q Okay. And I think there are some 01:35:08

20 groundwater maps. I think it was for HSU -- HSU-3a 01:35:10

21 that flow in a north -- northwest direction. We'll 01:35:15

22 get to that in -- in a couple minutes. 01:35:21

23 But this depiction seems to suggest that it 01:35:28

24 flows off the Whittaker-Bermite site, at least in 01:35:31

25 this hydrostatic unit, easy for me to say, in a west 01:35:33

1 southwest direction. 01:35:43

2 Did you look at this map in -- or did you 01:35:50

3 consider this map in forming your conclusion? 01:35:52

4 A To a certain extent, yes. 01:35:54

5 Q And what analysis did you do on this map to 01:36:07

6 determine whether or not it's an accurate depiction 01:36:09

7 of groundwater flow on page HSU-3c? 01:36:12

8 A Well, having looked at the water levels 01:36:21

9 indicated on this map and in my analysis of what I 01:36:23

10 was asked to look at, which was where TCE and PCE, 01:36:29

11 VOCs are migrating, I also looked at the water 01:36:35

12 quality data in this area. 01:36:38

13 Q Okay. Now, taking a look at where the 01:36:42

14 nearest arrow is to the Whittaker-Bermite site which 01:36:47

15 is -- if you characterize the Whittaker-Bermite site 01:36:50

16 as the horse head, it's like right around the mouth 01:36:57

17 of the horse -- horse head. 01:37:01

18 A Yes. 01:37:03

19 Q Are there any -- are there any monitoring 01:37:03

20 wells off-site in that location? 01:37:05

21 A You need to go down to the wells that are 01:37:11

22 closer to NC-11, NC-13. 01:37:14

23 Q Okay. Like is it -- is it a -- if you take 01:37:19

24 a look at the two arrows, you'll see one heading in 01:37:32

25 the west southwest direction and then further away 01:37:35

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1       toward -- toward the cluster of wells, you see a       01:37:39  
2       groundwater flow direction that heads, it looks       01:37:45  
3       like, west -- west northwest.       01:37:50

4               Is it possible that the groundwater flow       01:37:56  
5       direction may actually take a turn closer to the       01:37:59  
6       Santa Clara River area?       01:38:04

7               MR. HAGSTROM: Excuse me. Excuse me. That       01:38:10  
8       calls for speculation.       01:38:11

9               THE WITNESS: I mean the groundwater, I'm       01:38:15  
10       not quite sure what you mean by the term "take a       01:38:19  
11       turn." What this shows based on water levels,       01:38:21  
12       someone has drawn these lines in to indicate in       01:38:27  
13       certain areas what direction the groundwater is       01:38:31  
14       flowing based on those water levels.       01:38:34

15       BY MR. GEE:       01:38:36

16              Q       And you're basing your analysis on -- I       01:38:36  
17       think this -- you have to pardon me. I have to zoom       01:38:40  
18       in because my eyesight is not that good at all.       01:38:56

19               Are you basing your opinion on -- is that a       01:39:14  
20       well called MW-OS-5c? Is that -- that's a       01:39:19  
21       monitoring well, isn't it, in that vicinity?       01:39:26

22              A       Your question was the monitoring wells       01:39:33  
23       essentially southwest of OU-4 and, yes, OS-MW-05c is       01:39:36  
24       one of them.       01:39:43

25              Q       And what is the other one?       01:39:43

1           A       It's hard to see, but it's NC-13, HSU-3c.           01:39:47

2           Q       And the arrow is pointed in that general           01:39:52

3                   direction, but there seems to be a large -- large           01:39:58

4                   potential pathway, if you just look strictly at           01:40:03

5                   elevation levels, is that correct? I mean there is           01:40:09

6                   no -- it appears that the wells are quite a ways           01:40:14

7                   away from the site, and groundwater may or may not           01:40:22

8                   be flowing in that general direction or how did you           01:40:32

9                   determine that the groundwater was flowing in toward           01:40:35

10                  those wells?           01:40:37

11                  MR. HAGSTROM: Objection; compound.           01:40:38

12                  THE WITNESS: Mr. Gee, that was a pretty           01:40:43

13                   long multiple question, but I'll try to answer to           01:40:45

14                   the best of my recollection.           01:40:48

15                  BY MR. GEE:           01:40:49

16                  Q       Let me strike that -- let me strike the           01:40:49

17                   question.           01:40:50

18                   How did you determine whether the           01:40:51

19                   groundwater flows toward those wells in such a           01:40:52

20                   manner that they would impact those monitoring           01:40:59

21                   wells?           01:41:03

22                  A       I want to preface my answer this way, that           01:41:07

23                   what you're showing me in this exhibit is one           01:41:11

24                   snapshot in time and as I testified to earlier, with           01:41:16

25                   the water level data that's been collected over the           01:41:24

1 years at and near the vicinity of the site shows 01:41:27  
2 that water -- the flow directions vary. 01:41:31  
3 They vary due to pumping. They vary due to 01:41:35  
4 recharge, rainfall events, and so as a 01:41:38  
5 hydrogeologist, I wouldn't base my analysis on one 01:41:45  
6 snapshot in time. You're right. 01:41:48  
7 What this -- what this snapshot in time 01:41:52  
8 seems to indicate is a southwestern flow direction 01:41:55  
9 in S-3c from the OU-4 area of the Bermite site. I 01:42:01  
10 disagree with what you said that there appears to 01:42:08  
11 be -- sorry.  
12 THE REPORTER: Did you say SC? You said  
13 SC -- western flow direction SC from the OU-4?  
14 THE WITNESS: Yes.  
15 BY MR. GEE: 01:42:22  
16 Q I think you said S-3c, isn't that right, 01:42:22  
17 Mr. Hokkanen? 01:42:27  
18 A Yes, I did, sorry. I couldn't hear her 01:42:28  
19 exactly either. 01:42:32  
20 I believe part of your long question was 01:42:35  
21 that you're of the opinion that there was a large 01:42:39  
22 area that contaminants could migrate and then 01:42:43  
23 this -- these two monitoring wells, is that your -- 01:42:48  
24 I would disagree with that, sir. 01:42:51  
25 Q And what else have you done that -- to -- 01:42:56

1 to determine that my hypothesis is incorrect? 01:43:00

2 A Well, let me -- let me make sure I 01:43:10

3 understand your question so I can answer it as 01:43:14

4 accurately as I can. 01:43:16

5 Are you suggesting that there is not a 01:43:17

6 pathway from the Bermite site to the NC-11 and NC-13 01:43:20

7 wells? Is that the question? 01:43:27

8 Q No. The question is: How do you know that 01:43:28

9 the contamination that an HSU-3c flowing from OU-4 01:43:31

10 will impact the two monitoring wells that we see 01:43:41

11 fairly far distance away from the Whittaker-Bermite 01:43:49

12 site? 01:43:54

13 A Well, one is based on an analysis of water 01:43:56

14 levels over a much longer period of time than this 01:43:59

15 in that groundwater flow direction in this area 01:44:02

16 varies. It can vary quite a bit depending on these 01:44:06

17 wells pumping or not pumping. 01:44:11

18 Like I said earlier, this is right in the 01:44:13

19 vicinity south fork of the Santa Clara River. 01:44:15

20 Recharge events change groundwater elevations in the 01:44:21

21 flow directions. There are quite a few variables. 01:44:25

22 In addition to that, as I mentioned before, 01:44:28

23 given the variability of the groundwater flow 01:44:35

24 directions, contaminants that might migrate from the 01:44:37

25 Bermite site in this direction would not migrate 01:44:40



1 along a narrow little line. 01:44:44

2 Based on what I've seen of water quality 01:44:46

3 data at the site and groundwater flow directions, 01:44:49

4 you would get a fairly wide plume developing in this 01:44:52

5 area. 01:44:55

6 In my opinion is that if contaminants such 01:44:56

7 as VOCs were migrating in the southwestern 01:45:01

8 direction, you would see them in these two 01:45:05

9 monitoring wells. 01:45:09

10 Q Okay. You said a lot in that answer, 01:45:10

11 Mr. Hokkanen. 01:45:14

12 A I did. 01:45:14

13 Q You indicate that there's a lot of 01:45:16

14 different parameters that can influence groundwater 01:45:20

15 flow direction. 01:45:23

16 Is it possible to develop a model or do an 01:45:23

17 analysis to consider all the different permeations 01:45:29

18 and combinations of groundwater flow that can be 01:45:33

19 taking place from the Whittaker-Bermite site? 01:45:36

20 A It's possible to develop a model to look at 01:45:44

21 different combinations. Is it possible? It clearly 01:45:46

22 is. I'm not sure how much that would help you, but 01:45:50

23 it's certainly possible. 01:45:52

24 Q Okay. And based on such a model would 01:45:53

25 require data from different operations, would it 01:46:02

1	not?	01:46:04
2	A Different operations?	01:46:05
3	Q Yes.	01:46:08
4	A I'm sorry. I don't understand.	01:46:09
5	Q For example, if I were to -- want to find	01:46:10
6	out what the groundwater flow direction is before	01:46:16
7	all the wells were -- Saugus Formation wells were	01:46:19
8	installed, where would I get that -- where would I	01:46:24
9	get the data from?	01:46:26
10	A I don't think that data exists.	01:46:27
11	Q So how can you model groundwater flow	01:46:30
12	direction before the Saugus Formation wells were	01:46:37
13	installed?	01:46:41
14	A Well, I didn't say I would model it. I	01:46:41
15	believe that was your supposition, and as I	01:46:45
16	testified, I don't think that would help you that	01:46:48
17	much.	01:46:52
18	Q Okay. Well, it may help to explain what	01:46:54
19	occurred before 1988, would it not?	01:46:56
20	A Well, without a lot of data, I don't think	01:47:02
21	it would really help you that much. What we can use	01:47:04
22	however is the water quality data that we have.	01:47:06
23	What that tells you over a long period of time, for	01:47:10
24	example, using the perchlorate data, it tells you	01:47:14
25	over a long period of time where perchlorate has	01:47:17

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1 migrated. I think as a contaminant hydrogeologist, 01:47:20  
2 it tells me a lot. 01:47:26

3 Q Let's take a look at --

4 A Are you going to a new exhibit, sir? 01:47:51

5 Q I'm doing -- I'm doing my best. 01:47:52

6 A That seems fair.

7 Q Okay. Mr. Hokkanen, can you refresh your 01:49:17  
8 screen and take a look at Exhibit 317 which is a 01:49:19  
9 figure from your expert report, Figure 42. 01:49:29

10 And for the record, it's the -- it is a 01:49:35  
11 CH2M Hill drawing, and let me zoom in on the legend 01:49:41  
12 box. And it is labeled as "Figure 5-4 Distribution 01:49:49  
13 of TCE and Perchlorate in the Saugus Formation" from 01:49:58  
14 the Saugus Formation VOC Investigation Report. 01:50:05

15 (The document referred to was marked by the  
16 Reporter as Deposition Exhibit 317 for  
17 identification and is attached hereto.)

18 BY MR. GEE:

19 Q Mr. Hokkanen, I presume you're familiar 01:50:10  
20 with this -- with this drawing? 01:50:13

21 A I am. Yes, it's up on my screen. 01:50:13

22 Q Now, the orange area depicts perchlorate 01:50:18  
23 contamination; is that correct? 01:50:27

24 A Yes. 01:50:29

25 Q And the perchlorate contamination it looks 01:50:30

1       like it's -- it reaches far to the north and far to       01:50:37  
2       the south of the three wells that you identify in       01:50:42  
3       your report as being evidence that VOCs have not       01:50:46  
4       left the site.       01:50:50

5               Do you see that?       01:50:52

6           A       It does extend north and south of the       01:50:52  
7       western boundary of OU-4, that's correct.       01:50:57

8           Q       Okay. Did you consider the extent of the       01:50:59  
9       perchlorate contamination spread in your -- in       01:51:05  
10      your -- in forming your opinion that the -- that the       01:51:12  
11      pathway for VOCs must go through these three       01:51:17  
12      western-most OU-4 wells?       01:51:22

13          A       Did I consider the -- could you repeat       01:51:25  
14      that, the first part of that? I think I understood       01:51:28  
15      it.       01:51:31

16          Q       Okay. Did you consider the extent of       01:51:31  
17      perchlorate contamination to the north and south of       01:51:34  
18      the three monitoring wells on the west side of OU-4       01:51:39  
19      in forming your opinion that the absence of VOCs in       01:51:44  
20      the western-most OU-4 wells is proof that VOCs have       01:51:50  
21      not migrated off-site?       01:51:56

22          A       Yes, I did consider that. I considered       01:51:59  
23      that as part of my -- all of the water quality data       01:52:01  
24      that I examined to form that opinion.       01:52:04

25          Q       Okay. And your opinion is -- you also have       01:52:07

1 an opinion that VOCs will migrate in the same 01:52:10  
2 pathway as perchlorate. 01:52:16  
3 Is that the -- is that not your opinion 01:52:18  
4 number three, I believe? 01:52:20  
5 A Two. 01:52:21  
6 Q Two. 01:52:22  
7 A That's correct, yes, opinion two. 01:52:22  
8 Q Okay. Your opinion number two. So 01:52:27  
9 wouldn't that opinion suggest that VOCs can migrate 01:52:30  
10 in a much larger bandwidth, if you will, than what 01:52:35  
11 you have evaluated in your report which is just the 01:52:41  
12 three western-most OU-4 wells? 01:52:47  
13 A Well, is there -- is it plausible? It's 01:52:58  
14 plausible based on the perchlorate data. However, 01:53:00  
15 the perchlorate data clearly shows that perchlorate 01:53:03  
16 is migrating through the western boundary of OU-4, 01:53:05  
17 and given my second opinion that they follow the 01:53:10  
18 same pathway, VOCs would move through that same 01:53:15  
19 boundary, and based on my analysis of the data, they 01:53:18  
20 haven't moved through that boundary. 01:53:23  
21 Q Okay. And I think you're probably prepared 01:53:24  
22 for this question, if counsel did his job, but let 01:53:37  
23 me introduce another -- do you know who Mr. Thomas 01:53:43  
24 Sheahan is? 01:53:52  
25 A Yes. 01:53:52

1 Q And you -- you're aware that he was an 01:53:56  
2 expert witness in the 2000 perchlorate -- 01:54:04  
3 perchlorate litigation regarding plaintiff's wells 01:54:15  
4 in the -- in the Whittaker-Bermite site? 01:54:22  
5 A In a general way, I'm familiar. I don't 01:54:25  
6 really know any details. 01:54:28  
7 Q You have to excuse me. It takes a minute 01:54:29  
8 because using previously introduced requires a 01:55:14  
9 different -- different series of clicks. 01:55:19  
10 Okay. Mr. Hokkanen, hopefully you'll see 01:55:34  
11 in the -- in the folder what was previously marked 01:55:36  
12 as Exhibit 293. 01:55:40  
13 A I have that one, sir. 01:55:51  
14 Q Have you seen this exhibit before? 01:55:54  
15 A I don't believe I have, no. 01:56:00  
16 Q Did you talk to -- have you discussed your 01:56:02  
17 deposition with Mr. Hagstrom in the last two or 01:56:12  
18 three days? 01:56:17  
19 A Who? I'm sorry, sir. 01:56:20  
20 Q Have you discussed your deposition with 01:56:21  
21 Mr. Hagstrom in the last two or three days? 01:56:24  
22 A In a general way, yeah. 01:56:31  
23 Q What -- in a general way, what did you 01:56:33  
24 discuss? 01:56:37  
25 A What was -- nothing really specific, just 01:56:49

1 really sort of getting prepared a bit on when it was 01:56:52  
2 and that sort of thing. 01:56:56  
3 Q Did the deposition of Tony Daus come up at 01:56:58  
4 all during your preparation discussions? 01:57:03  
5 A Briefly, yes. 01:57:07  
6 Q Did Mr. Hagstrom indicate that there was a 01:57:08  
7 declaration by Mr. Sheahan introduced at the Tony 01:57:13  
8 Daus deposition? 01:57:20  
9 A No. 01:57:21  
10 Q Okay. Why don't you take a minute -- 01:57:22  
11 A I was not aware of that. 01:57:26  
12 Q Okay. Why don't you take a look at the 01:57:27  
13 Exhibit 293 and for the record, it is entitled -- 01:57:35  
14 it's a pleading entitled the "Declaration of N. 01:57:38  
15 Thomas Sheahan," dated May 27, 2003. 01:57:41  
16 Why don't you take a look at PDF page 01:57:53  
17 number 6 which is the summary of opinion. Let me 01:57:56  
18 know when you're done. 01:58:10  
19 A Would you like me to read that whole page, 01:58:11  
20 sir? 01:58:13  
21 Q Just underneath the Roman numeral I, 01:58:13  
22 summary of opinion. 01:58:16  
23 A Okay. I read it once. 01:59:28  
24 Q And just to confirm, you -- does this 01:59:29  
25 memory refresh -- does this document refresh your 01:59:32

1 memory as to whether or not you've ever seen this 01:59:35  
2 document before? 01:59:37  
3 A No, I'm certain I've never seen this 01:59:37  
4 document. 01:59:40  
5 Q Okay. Now, in the document, Mr. Sheahan 01:59:40  
6 uses the low perchlorate reading in MP-1 to opine 01:59:47  
7 that the Whittaker-Bermite site is not the source of 01:59:57  
8 perchlorate that is found in Saugus-1 and Saugus-2. 02:00:01  
9 Is that -- is that consistent with your 02:00:07  
10 reading of the opinion? 02:00:10  
11 A It seems to be part of it, yes, sir. 02:00:11  
12 Q And MP-1, isn't that one of the three wells 02:00:15  
13 that you use in -- to rely on your opinion as for 02:00:22  
14 not having VOCs? 02:00:26  
15 A Just for the record, there are actually 02:00:28  
16 quite a few more than three wells along the western 02:00:32  
17 boundary of OU-4. There are three well nests along 02:00:35  
18 the western border. 02:00:40  
19 So MP-1, quite frankly, there are literally 02:00:42  
20 ten sampling points at MP-1. So I'm not sure which 02:00:48  
21 sampling point he's talking about. 02:00:53  
22 Q Linda, I don't know if you got that down, 02:00:57  
23 but I missed half your answer there, Mr. Hokkanen. 02:01:00  
24 Can you repeat your answer? 02:01:05  
25 A Sorry about that. I'm sorry. We're having 02:01:06



1 a little delay issue. 02:01:10

2 What I said, I believe, was that there are 02:01:12

3 actually ten sampling points at location MP-1. And 02:01:15

4 so when he -- when he refers to MP-1, I'm not sure 02:01:22

5 which sampling point he's referring to of the ten. 02:01:28

6 Q MP, from what I understand, is the 02:01:31

7 abbreviation for a multiport well; is that correct? 02:01:40

8 A That's correct. 02:01:48

9 THE REPORTER: I'm sorry. A multi what?

10 MR. GEE: Multiport, p-o-r-t.

11 THE WITNESS: P-o-r-t, port. 02:01:52

12 BY MR. GEE: 02:01:52

13 Q Okay. Does his -- does Mr. Sheahan's 02:01:52

14 opinion -- I'm looking at the last line in the 02:01:58

15 second paragraph -- suggest that he may have looked 02:02:02

16 at more than one sample analysis from MP-1? 02:02:06

17 MR. HAGSTROM: Calls for speculation. 02:02:13

18 THE WITNESS: Okay. 02:02:19

19 BY MR. GEE: 02:02:20

20 Q Well, let me withdraw that question and ask 02:02:20

21 another one. 02:02:22

22 The words in parenthesis that says "with 02:02:24

23 the highest concentration reported at less than 02:02:27

24 21 micrograms per liter," does that suggest to you, 02:02:30

25 sir, that you looked at more than one sample result? 02:02:35

1           A     It could be multiple sampling events. I'm     02:02:42  
2                   not certain what he means.                   02:02:45  
3           Q     Okay. When he says "the highest             02:02:47  
4                   concentration," does that suggest that you look at     02:02:50  
5                   more than one sample analysis -- looked at more than     02:02:52  
6                   one sample result?                   02:02:56  
7           A     In general, that's -- that seems probable.     02:02:57  
8           Q     Okay. And he reported the highest             02:03:03  
9                   concentration; is that correct?             02:03:08  
10          A     That's what the document says, yes.           02:03:09  
11          Q     And he also references a sample result from     02:03:14  
12               MP-2.                   02:03:24  
13                   Do you see that in the -- I don't know, is     02:03:25  
14                   that the second -- second paragraph, first line or     02:03:27  
15                   first sentence?                   02:03:31  
16          A     Yeah, I see that.                   02:03:33  
17          Q     Yeah. 58,000 micrograms per liter?           02:03:34  
18          A     Yes.                   02:03:38  
19          Q     Is MP-2 in OU-3 or OU-4 one of the             02:03:38  
20               operating units that's the subject of your opinion?     02:03:45  
21          A     One of the two. I can't remember which one     02:03:47  
22               it's in.                   02:03:52  
23          Q     Okay.                   02:03:53  
24          A     I'd have to look at a map -- at a well map.     02:03:54  
25          Q     Okay. But he seems to be suggesting here     02:03:57

1 that the low concentrations in MP-1 suggest that the 02:04:03  
2 perchlorate in Saugus-1 and Saugus-2 cannot be from 02:04:08  
3 the Whittaker-Bermite site; is that -- is that a 02:04:12  
4 fair reading of the summary of his opinion? 02:04:16  
5 MR. HAGSTROM: Calls for speculation, lacks 02:04:20  
6 foundation. 02:04:22  
7 THE WITNESS: Well, I haven't read the 02:04:29  
8 whole document. I guess as -- as you folks like to 02:04:30  
9 say, the document speaks for itself. 02:04:36  
10 BY MR. GEE: 02:04:38  
11 Q Yes, it does, but you've never seen this 02:04:38  
12 document before? 02:04:42  
13 A No, I have not. 02:04:42  
14 Q Okay. And so I'm asking whether his use of 02:04:43  
15 MP-1 to demonstrate that perchlorate is not the 02:04:53  
16 source of -- of -- or that the Whittaker-Bermite 02:05:00  
17 site is not the source of perchlorate contamination 02:05:05  
18 in Saugus-1 and 2, have any similarities to your 02:05:08  
19 opinion that the absence of -- I shouldn't say 02:05:12  
20 absence, but the low detection frequency of VOCs in 02:05:16  
21 MP-1 as well as the other two well clusters is 02:05:22  
22 evidence that VOCs found in the Saugus-1 and 2 wells 02:05:29  
23 cannot be from the Whittaker-Bermite site? 02:05:33  
24 MR. HAGSTROM: Objection; compound. 02:05:35  
25 THE WITNESS: Can you break that up just a 02:05:42

1 little bit? I want to understand your question. 02:05:44

2 BY MR. GEE: 02:05:46

3 Q Okay. Let me -- let me strike the question 02:05:46

4 and ask another one. 02:05:50

5 Do you see any similarities between 02:05:52

6 Mr. Hokkanen's use of MP-1 results to argue that the 02:05:54

7 perchlorate in Saugus-1 and 2 are not from a 02:06:03

8 Whittaker-Bermite site to your opinion that the low 02:06:07

9 detection levels in MP-1 and the two other well 02:06:16

10 clusters is evidence that VOCs found in Saugus-1 and 02:06:20

11 2 are not from the Whittaker-Bermite site? 02:06:24

12 MR. HAGSTROM: Object to the form. It's 02:06:27

13 compound. 02:06:28

14 THE WITNESS: I'll answer it this way, 02:06:31

15 Mr. Gee. I won't speak for Mr. Sheahan and his 02:06:34

16 opinions. I will say that he had -- this is dated 02:06:38

17 2003. I have 17 years of additional data to 02:06:44

18 consider. I considered that data, and I formed my 02:06:48

19 opinions based on that data. 02:06:53

20 BY MR. GEE: 02:07:04

21 Q Okay. Let's move on. I forget there's a 02:07:04

22 delay. Sometimes when you get in -- when you click 02:07:24

23 the wrong button, it takes you about four or five 02:07:25

24 clicks to get back on track. 02:07:28

25 A Linda, how am I doing on the voice? 02:09:03

1 THE REPORTER: Pretty good. There are 02:09:09  
2 still pockets, but I'm trying to interrupt when I 02:09:10  
3 need to. 02:09:13  
4 THE WITNESS: Okay.  
5 MR. GEE: Okay. Mr. Hokkanen, hopefully 02:10:35  
6 Exhibit 318 will show up shortly. 02:10:38  
7 THE WITNESS: Yes, it has. 02:10:46  
8 MR. HAGSTROM: I have it. 02:10:47  
9 (The document referred to was marked by the  
10 Reporter as Deposition Exhibit 318 for  
11 identification and is attached hereto.)  
12 BY MR. GEE: 02:10:49  
13 Q Mr. Hokkanen, this is another map generated 02:10:49  
14 by AECOM, and it appears to be -- I believe from 02:10:56  
15 another -- probably the same groundwater sampling -- 02:11:07  
16 or the quarterly groundwater sampling report, and 02:11:12  
17 this one purports to be the potentiometric surface 02:11:16  
18 map for Saugus Formation HSU-S3a. 02:11:23  
19 Do you see the contour lines on this map? 02:11:31  
20 A Yes. 02:11:34  
21 Q This map appears to suggest that there's 02:11:35  
22 also a possibility, at least in this hydrostatic 02:11:42  
23 unit, that groundwater can actually flow in the west 02:11:46  
24 northwest direction? 02:11:50  
25 A I'm sorry. Your question was that 02:11:57

1 groundwater could flow in the west northwest 02:11:59  
2 direction? 02:12:03  
3 Q Yes. 02:12:07  
4 A Yes, I want to say I've examined this map 02:12:07  
5 previously, and there's -- there's some issues I 02:12:11  
6 have with this map based on the contour lines. If 02:12:14  
7 you'd like to, we can get into that. 02:12:20  
8 However, this map purports to show flow to 02:12:24  
9 the west northwest which is the general flow 02:12:26  
10 direction that has been indicated over years in 02:12:30  
11 Saugus 3a. 02:12:33  
12 Q Okay. What is -- when you say you have 02:12:41  
13 some issues, did you express your concerns about 02:12:43  
14 these issues to Whittaker and perhaps suggest that 02:12:52  
15 maybe -- that these issues should be considered in 02:12:59  
16 terms of whether or not to continue using AECOM as a 02:13:02  
17 consultant or how -- let me ask a different 02:13:08  
18 question. 02:13:12  
19 How major are the issues that you have with 02:13:12  
20 this -- with this drawing and maybe you could 02:13:14  
21 articulate what issues you do have with the drawing? 02:13:17  
22 A Well, the issues have to do with trying 02:13:19  
23 to -- trying to draw water level contour lines from 02:13:23  
24 data real live -- real-world data, and the data 02:13:30  
25 always -- doesn't always cooperate and give you 02:13:36

1 smooth contour lines. 02:13:40

2 I'll give you a couple of examples. If you 02:13:42

3 can zoom in on some of these wells, for example, 02:13:46

4 there's a well RMW-08b, which is on the 02:13:49

5 northern-most corner of the western boundary of 02:13:55

6 OU-4, the water level in that well is indicated here 02:13:58

7 as about 1,070. The contour lines that it's drawn 02:14:05

8 between are 1,035 and 1,040. Well, that can't be. 02:14:10

9 So where do you fit that in given the fact 02:14:21

10 that a well immediately south of it PZ-09b is at 02:14:24

11 1,040 which is right on the 1,040 line. Now that 02:14:33

12 doesn't mean that AECOM did anything wrong. The 02:14:37

13 person who drew these contour lines is trying to use 02:14:41

14 this data and draw, to the best of their ability, 02:14:44

15 the water level contour lines. 02:14:48

16 Now, are they exactly like this in the real 02:14:50

17 world? It doesn't appear to be. Another example is 02:14:53

18 here down at the OS-MW-05a and b wells. Those wells 02:14:58

19 are located right next to each other. Both screened 02:15:04

20 in the Saugus 3a-HSU, one well is at 1063 and one at 02:15:08

21 1049. 02:15:15

22 So the person drawing these contour lines 02:15:16

23 has to decide which of those two values to use. 02:15:19

24 They happened to choose 1049. 02:15:23

25 Now, if he would have chosen 1063, the 02:15:26

1 contour lines would look different, and so it's 02:15:29  
2 using actually measured water levels to draw the 02:15:33  
3 contour lines. 02:15:37

4 I'm sorry. That was a long explanation, 02:15:40  
5 but I've looked at this figure before, and there are 02:15:43  
6 a number of these water level contour maps where you 02:15:45  
7 have the same thing, where the water levels aren't 02:15:48  
8 smoothly moving in one direction, for example. 02:15:51

9 Q Okay. Mr. Hokkanen, you did mention that, 02:15:53  
10 in addition to water contour lines, that you use 02:15:58  
11 groundwater contamination data to determine that -- 02:16:02  
12 to determine flow path, is that correct, so that in 02:16:10  
13 addition to groundwater -- or surface contours, you 02:16:15  
14 also considered groundwater contamination data? 02:16:21

15 A Yes, I did over -- I looked at a -- I 02:16:27  
16 looked at water quality data over the period of 02:16:31  
17 record which was quite a long time. 02:16:34

18 Q Okay. To the north of OU-4, what 02:16:38  
19 groundwater monitoring data did you look at? 02:16:42

20 A There's a well nest just north of OU-4. 02:16:48  
21 It's the CW-01 well nest. 02:16:51

22 Q If you go -- I'm going to let you choose a 02:16:55  
23 drawing from your report, do you have the drawing 02:17:00  
24 from your report that shows where that nest -- well 02:17:03  
25 nest is? 02:17:07



1           A     I believe so. Take me just a little bit.           02:17:09

2           I have a figure that shows -- actually a series of           02:17:18

3           figures, but the main figure is showing a majority           02:17:22

4           of the wells.           02:17:26

5                   The download has to catch up. Hold on a           02:17:46

6           minute.           02:17:48

7           Q     That's okay. I probably clicked later than           02:17:49

8           you did. So it's going to take me longer to catch           02:17:52

9           up than you.           02:17:55

10          A     Figure 7 -- Figure 7 --           02:17:55

11                   MR. HAGSTROM: Mr. Hokkanen --           02:17:57

12           Mr. Hokkanen, can you tell us the PDF page that           02:17:59

13           you're looking at?           02:18:02

14                   THE WITNESS: I certainly can. It's page           02:18:07

15           112.           02:18:09

16                   MR. HAGSTROM: Thank you.           02:18:09

17                   THE WITNESS: This appears to be from -- I           02:18:56

18           believe AECOM includes this figure in all of their           02:18:59

19           quarterly reports.           02:19:02

20           BY MR. GEE:           02:19:16

21           Q     Uh-oh. I say uh-oh because I clicked what           02:19:16

22           I thought was a rotate button -- rotate drawing           02:19:21

23           button and I almost got out of the report           02:19:25

24           altogether.           02:19:26

25                   And you said PDF 112 which is Figure 7?           02:19:49

1	A	Yes, sir.	02:19:55
2	Q	Okay. I found the button that allows me to	02:20:12
3		rotate the drawing so I can -- I can get my bearings	02:20:16
4		straight.	02:20:19
5		Okay. All right. I see the CW-01a and,	02:20:31
6		you know, for -- for the record, it looks like	02:20:38
7		CW-01a is maybe 40 percent of the way between the	02:20:43
8		north of OU-4 and the dotted line called that --	02:20:48
9		that shows the Holser fault.	02:20:54
10		Is that the one that you're referring to?	02:20:55
11	A	Yes, sir.	02:20:57
12	Q	Okay. And what information does the CW-01	02:20:59
13		well show? What kind of data did you consider from	02:21:11
14		CW-01a -- or CW-01? There's an a, b and c, it looks	02:21:16
15		like.	02:21:20
16	A	Well, as I've testified before, water level	02:21:22
17		data and water quality data.	02:21:28
18	Q	Okay. And what kind of results did you	02:21:34
19		get -- were you seeing with the water quality data?	02:21:36
20	A	Well, you have perchlorate detections in	02:21:43
21		all three wells and no VOC detections in any of the	02:21:46
22		wells.	02:21:52
23	Q	Okay. What did you glean from the water	02:21:58
24		quality data -- I'm sorry -- water elevation data --	02:22:02
25		it's getting late.	02:22:04

1                   You indicated that you considered both the                   02:22:06  
2                   water elevation data and water quality data.   What                   02:22:09  
3                   did you glean from the water elevation data?                   02:22:14

4                   A       I looked at the water elevation data for                   02:22:19  
5                   CW-01a, b, and c.   I almost compared that -- the                   02:22:24  
6                   water level data to --what appear to be the closest                   02:22:29  
7                   wells for south of CW-01 well nest, and that's                   02:22:35  
8                   RMW-03a, b, and c.

9                   Referring to the Saugus-3a formation, I                   02:22:55  
10                  looked at the wells -- the water levels and actually                   02:22:57  
11                  the elevation of the well screens in Saugus -- in                   02:22:59  
12                  the RMW-3a and CW-01 wells, and the water levels are                   02:23:06  
13                  basically the same.   They're very similar which                   02:23:12  
14                  indicates to me that the CW-01 wells are not                   02:23:16  
15                  downgradient of RMW-03.   They're cross -- what we                   02:23:20  
16                  call cross-gradient.                   02:23:25

17                  Q       Okay.   And if it's cross-gradient, can you                   02:23:28  
18                  tell whether it flows one direction or the other and                   02:23:38  
19                  if they're at the same elevation approximately?                   02:23:41

20                  A       The cross -- sorry.   Did you ask --                   02:23:43

21                  Q       Yeah.   If they're at the same elevation and                   02:23:46  
22                  are cross-gradient, can you get -- do you have any                   02:23:49  
23                  information that helps you decide what flow                   02:23:54  
24                  direction the groundwater goes in that area?                   02:23:58

25                  A       What cross-gradient means is that                   02:24:00

1 groundwater from RMW-03 is not flowing to CW-01. If 02:24:06  
2 they're the same -- if the water level is the same, 02:24:12  
3 as I -- as I say, water flows downhill. You know, 02:24:18  
4 so it flows from a high elevation to a low 02:24:22  
5 elevation. 02:24:25

6 And so given the fact that the water levels 02:24:27  
7 are very close basically, the same groundwater does 02:24:29  
8 not appear based on the water levels to be flowing 02:24:34  
9 from the RMW-03 location to the CW-01 location. 02:24:38

10 Q Mr. Hokkanen, I am introducing Exhibit 289, 02:24:47  
11 which is an exhibit that was used previously, and 02:25:37  
12 for the record, this document is labeled CH2M Hill 02:25:48  
13 drawing, and it appears to be Figure 5-5, and it's 02:26:00  
14 entitled "Whittaker-Bermite Conceptual Saugus 02:26:24  
15 Formation VOC Migration Pathways." 02:26:29

16 Let me know once you've had an opportunity 02:26:35  
17 to take a look at this drawing. First of all, is 02:26:37  
18 this drawing familiar to you? 02:26:39

19 A Very familiar. It's in the 2015 VOC 02:26:42  
20 report. 02:26:45

21 Q Okay. And, Mr. Hokkanen, are you familiar 02:26:45  
22 with a -- what I'm going to consider a natural pump 02:26:53  
23 test which is done at the startup of Saugus-1 and 02:27:03  
24 Saugus-2 wells back around 2011? 02:27:07

25 Let me describe what I understand the test 02:27:13

1 to have accomplished or set out to accomplish. 02:27:17

2 In 2011, there was a very unique 02:27:27

3 opportunity for CH2M Hill, which was doing work on 02:27:29

4 behalf of the Army Corps of Engineers, to operate -- 02:27:33

5 or to monitor the different groundwater monitoring 02:27:40

6 well elevations during the startup and operation of 02:27:46

7 Saugus-1 and Saugus-2. 02:27:50

8 And what CH2M Hill did is they created what 02:27:54

9 they call a Saugus-a and Saugus-b designation and 02:27:58

10 the Saugus-a designation was basically areas where 02:28:02

11 wells showed no elevation impacts associated with 02:28:09

12 the startup of Saugus-1 and Saugus-2. 02:28:14

13 And Saugus-b was -- is considered the areas 02:28:18

14 in Saugus Formation for which wells did show some 02:28:24

15 sort of response associated with the startup of 02:28:27

16 Saugus-1 and Saugus-2. 02:28:32

17 Are you familiar with that -- with that 02:28:33

18 test? 02:28:37

19 A Yes. 02:28:37

20 Q And earlier we talked about pump tests in 02:28:38

21 general, and this particular report -- I haven't 02:28:43

22 read it for quite some time, I don't recall the 02:28:50

23 specifics at this point, but, you know, like 02:28:52

24 basically it just categorized the wells as either 02:28:54

25 being hydrogeologically connected or not 02:28:58

1 hydrogeologically connected based on either the 02:29:03  
2 response or absence of response of groundwater well 02:29:09  
3 elevation when Saugus-1 and Saugus-2 restarted. 02:29:14  
4 Are you familiar that -- with the details 02:29:21  
5 of that test? 02:29:22  
6 A To a certain extent, yes. 02:29:26  
7 Q And earlier we talked about, you know, like 02:29:30  
8 factors associated with -- you know, like wells that 02:29:33  
9 do not respond to pumping groundwater in different 02:29:38  
10 aquifers and you've mentioned that there's a lot of 02:29:42  
11 different factors that go into determining whether 02:29:48  
12 or not a well is hydrogeologically connected to a 02:29:52  
13 water production aquifer. 02:30:00  
14 Do you remember that testimony? 02:30:04  
15 A Yes. 02:30:05  
16 Q And there were wells that -- that were 02:30:05  
17 farther away from CW-1a, CW-2a, and CW-1c that 02:30:17  
18 actually did have a response to the Saugus-1 and 02:30:24  
19 Saugus-2 restart, even though they're further away 02:30:28  
20 from the Saugus-1 and Saugus-2 wells as compared to 02:30:34  
21 CW-1. 02:30:38  
22 And one of the things that CH2M Hill 02:30:51  
23 concluded was that because they did not get a 02:30:53  
24 response at CW-1, that that well is not 02:30:55  
25 hydrogeologically connected to the Saugus aquifer 02:31:01

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1 for which -- from which Saugus-1 and Saugus-2 draw 02:31:08  
2 from. 02:31:12  
3 Have you analyzed that report and those 02:31:13  
4 conclusions and do you have an opinion as to whether 02:31:17  
5 or not the conclusions reached in that report are 02:31:23  
6 supportable? 02:31:26  
7 A Probably not to the extent that you asked 02:31:30  
8 the question. I have read the report. I've looked 02:31:32  
9 at the data. I can't remember all -- there's a 02:31:35  
10 table with all of the drawdowns during the testing. 02:31:40  
11 I think there was a small response in the 02:31:44  
12 CW wells, but not as big as they expected. I don't 02:31:46  
13 remember which conclusion -- what conclusions they 02:31:50  
14 drew from that. 02:31:53  
15 Q Okay. Well, take a look at the -- as a 02:31:53  
16 result of the lack of response in CW-01, they've -- 02:32:00  
17 on the right-hand side drawing, they drew a 02:32:06  
18 potential plausible flow scenario from the 02:32:09  
19 contamination found, I believe, in OU-5 down toward 02:32:19  
20 the Saugus wells, and we can probably go back to 02:32:24  
21 your drawings. 02:32:27  
22 But I think these 33 MW wells and the 02:32:27  
23 RMW-4a, b, and c may either be in OU-4 or OU-5. The 02:32:35  
24 question that they had is they weren't seeing the 02:32:49  
25 contamination in CW-1a, b, and c, and so they wanted 02:32:51

1 to postulate and come up with potential reasons as 02:32:57  
2 to why the CW-01 did not show contamination while 02:33:03  
3 all the other wells did show contamination. 02:33:13  
4 A All of which other wells, sir? 02:33:17  
5 MR. HAGSTROM: And I'm going to object that 02:33:19  
6 this is -- this is compound. 02:33:20  
7 Sorry, Byron, sorry. 02:33:20  
8 BY MR. GEE: 02:33:25  
9 Q Okay. When I say "other wells," RMW-4, 02:33:25  
10 PZ-4a b, and c, and 33-MW-1, it looks like. 02:33:31  
11 A And what's the question? 02:33:43  
12 Q Did you consider CH2M Hill's analysis on 02:33:45  
13 the conductivity or the connectivity to the Saugus 02:33:52  
14 Formation hydrostatic units that feed into Saugus-1 02:34:01  
15 and Saugus-2 in reaching your conclusion that there 02:34:05  
16 is no contamination migrating to the north of OU-4? 02:34:11  
17 A Well, there actually is. Perchlorate has 02:34:18  
18 been detected in all three of those wells, CW-1a, b, 02:34:20  
19 and c, but VOCs haven't. 02:34:25  
20 Mr. Gee, let me add to that. The other 02:34:38  
21 thing I looked at were the water levels that had 02:34:40  
22 been collected from the CW-1 well nest and the 02:34:45  
23 closest well nest to it, the RMW-4 well nest, and 02:34:51  
24 water levels in the CW-1 well nest are anywhere from 02:34:57  
25 10 to 40 to 50 feet higher than they are in the 02:35:02



1 RMW-4 well nest. 02:35:09

2 And as I testified to earlier, water tends 02:35:11

3 to flow downhill which indicates to me that water 02:35:13

4 isn't flowing towards CW-1 from the RMW-4 well nest. 02:35:17

5 Q But your flow -- your flow conclusion, does 02:35:27

6 that presume that CW-1 and RMW-4 are slotted in the 02:35:32

7 same aquifer? 02:35:43

8 A Well, the -- what I did look at is the 02:35:45

9 elevation of the screens between RMW-4 and CW-1 and, 02:35:52

10 for example, RMW-4a is screened over 100 feet higher 02:36:01

11 than CW-1c, and it's also screened higher than 02:36:07

12 CW-1b. 02:36:17

13 So I compared those water levels and they 02:36:18

14 were considerably higher in the CW-1b and CW-1c 02:36:20

15 monitoring wells. 02:36:25

16 Q Okay. What did you do to confirm that they 02:36:28

17 were within the same aquifer? 02:36:29

18 A I believe there's published -- published 02:36:37

19 information about where these different aquifers 02:36:40

20 are. The CW well nest is essentially in what's 02:36:44

21 considered the Saugus-3 formation, which is what's 02:36:48

22 called an undifferentiated area of the site. 02:36:56

23 Q And when you say "undifferentiated" -- 02:37:05

24 "undifferentiated area," what does that -- does that 02:37:08

25 mean in hydrogeological terms? 02:37:11

1           A       What that means is that when they examined       02:37:14  
2       the well logs for those wells, they couldn't       02:37:19  
3       determine if they were in, for example, Saugus 3a or       02:37:21  
4       Saugus 3c.       02:37:25

5                   Apparently I've seen -- I believe it was       02:37:32  
6       CH2M Hill, I can't remember the exact report. I       02:37:34  
7       think it might have been actually the report for the       02:37:37  
8       startup of Saugus-1 and 2. In that report, they       02:37:40  
9       identified CW-1a and Saugus Formation.       02:37:48

10                   THE REPORTER: I'm sorry. And the Saugus  
11       what? I'm sorry. And the Saugus what?

12                   THE WITNESS: CW-1a was identified in that       02:37:59  
13       report, I believe, go look at it, as being in the       02:38:03  
14       Saugus 3a unit. They identified CW-1c as being in       02:38:07  
15       the Saugus 3c unit.       02:38:15

16                   THE REPORTER: Earl -- Earl, can you mute?       02:38:35  
17       I'm getting a little bit of feedback from you.       02:38:38  
18       Thank you.       02:38:41

19       BY MR. GEE:       02:39:38

20           Q       Okay. Mr. Hokkanen, hopefully there will       02:39:38  
21       be an exhibit previously marked as Exhibit 11 from       02:39:44  
22       the Hassan Amini deposition.       02:39:49

23           A       Yes, sir, I have it.       02:39:57

24           Q       Now, for the record, this is an       02:39:59  
25       AECOM-generated diagram. Again, AECOM is       02:40:12

1 Whittaker's consultant, and it is a simulated 02:40:15  
2 hydrologic containment of pumping Saugus production 02:40:22  
3 wells drawing for S-3c. 02:40:28

4 So, Mr. Hokkanen, granted that -- that this 02:40:38  
5 is a simulation, does this simulation demonstrate 02:40:43  
6 that potentially operating the Saugus Formation 02:40:53  
7 wells can have a fairly dramatic impact on 02:41:02  
8 groundwater flow patterns? 02:41:06

9 A I'm not quite sure what you mean by the 02:41:11  
10 word "dramatic," but as I testified to earlier, 02:41:13  
11 production well pumping will impact groundwater flow 02:41:16  
12 directions. 02:41:22

13 Q Okay. And without going or without knowing 02:41:24  
14 the history of the groundwater well pumping flow 02:41:28  
15 rates -- well, have you evaluated the groundwater -- 02:41:32  
16 historic groundwater pumping flow rates in the 02:41:41  
17 Saugus Formation wells as part of your analysis? 02:41:47

18 A I have looked at the pumping rates, yes. 02:41:49

19 Q Historically from 1988 to now? 02:41:54

20 A Yes. 02:42:01

21 Q Okay. What -- did you do any analysis with 02:42:02  
22 that information? 02:42:09

23 A Not particularly, no. 02:42:12

24 Q Okay. And were there periods of time, for 02:42:14  
25 example, when the NC-12 and 13 wells operated when 02:42:23

1 Saugus-1 and Saugus-2 did not operate? 02:42:33

2 A I believe that's correct, yes. 02:42:36

3 Q And what about vice versa, were there times 02:42:40

4 when Saugus-1 and Saugus-2 operated and NC-12 and 02:42:44

5 NC-13 did not operate? 02:42:49

6 A There are a lot of years in that data. I 02:42:55

7 can't specifically recall all of the data. That may 02:42:57

8 be correct. I'll have to take your word for it. 02:43:01

9 Q You know, based on this -- on this 02:43:07

10 simulation, couldn't there be a lot of different 02:43:11

11 permeations and combinations of groundwater flow 02:43:16

12 depending on which pump is operating at what time? 02:43:20

13 A That is a fair statement, yes. 02:43:24

14 Q Okay. And knowing that, is it possible 02:43:26

15 that the VOC flows from the Saugus Formation -- from 02:43:38

16 the Whittaker-Bermite site may have taken a 02:43:46

17 different direction than the west -- than the 02:43:50

18 western -- western-most section of OU-4? 02:43:53

19 MR. HAGSTROM: Calls for speculation. 02:43:58

20 THE WITNESS: Well, two-part answer to 02:44:02

21 that. One, I have a groundwater monitoring 02:44:05

22 background. I did that for my thesis. I've done a 02:44:11

23 lot since. 02:44:13

24 I've looked at a series of modeling efforts 02:44:15

25 that have been done in this area. They tend to show 02:44:18

1 different results depending on what assumptions you 02:44:23  
2 make and what data you use, monitoring conditions, 02:44:26  
3 hydraulic conductivity. 02:44:31

4 There are a lot of factors. They all tend 02:44:32  
5 to show something a little different. Since we're 02:44:34  
6 looking at this particular exhibit, what I find 02:44:37  
7 interesting is that the flow lines going to Saugus-2 02:44:41  
8 go right through the western boundary of OU-4, which 02:44:46  
9 is what I've been saying. 02:44:52

10 BY MR. GEE: 02:45:02

11 Q Are you saying that all flow lines go 02:45:02  
12 through the western boundary of OU-4 that's going to 02:45:05  
13 Saugus-2? 02:45:09

14 A That wasn't my testimony. 02:45:09

15 Q Pardon? 02:45:10

16 A That wasn't my testimony. What I said is 02:45:11  
17 there are flow lines -- 02:45:13

18 Q Okay. 02:45:15

19 A -- in this particular permutation that go 02:45:16  
20 through western boundary of OU-4. 02:45:20

21 Q Okay. I see that. But is it theoretically 02:45:23  
22 possible for some of the -- some of the 02:45:35  
23 contamination -- VOC contamination from OU-4 to go 02:45:39  
24 around the -- to the south of the three wells that 02:45:44  
25 you cite in your opinion? 02:45:49

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1 MR. HAGSTROM: Objection; calls for an 02:45:51  
2 incomplete hypothetical. 02:45:53  
3 Go ahead. I'm sorry. 02:45:55  
4 THE WITNESS: Let me answer it this way. 02:45:57  
5 What these -- for this particular model run -- and I 02:46:03  
6 don't know what assumptions they used and the data 02:46:07  
7 they put into it. So I'm just -- I'm taking this at 02:46:11  
8 face value. 02:46:15  
9 BY MR. GEE: 02:46:16  
10 Q Okay. 02:46:16  
11 A Because I've seen a lot of different model 02:46:17  
12 runs in this area with a lot of different results 02:46:20  
13 depending on the data you use and the assumptions 02:46:23  
14 you make. 02:46:26  
15 So, yes, there are flow lines that go from 02:46:29  
16 OU-4, for example, around and then to Saugus-2. 02:46:33  
17 However, if you have VOCs moving along those flow 02:46:41  
18 lines and that flow path is longer than the flow 02:46:47  
19 path through the western boundary, you should see 02:46:52  
20 VOCs on the western boundary wells of OU-4. 02:46:56  
21 VOCs don't have like their own distinct 02:47:01  
22 flow path. They follow the flow path of the 02:47:05  
23 groundwater and the flow path that the perchlorate 02:47:08  
24 took. 02:47:11  
25 Q Mr. Hokkanen, you indicated that you didn't 02:47:12

1 read Mr. Daus's expert report, but Mr. Daus in 02:47:45  
2 opining that the -- that the VOCs were contained on 02:47:56  
3 the site suggested that there was a ridge -- a 02:48:03  
4 groundwater ridge that runs parallel to the western 02:48:13  
5 boundary of OU-4. 02:48:18  
6 Would -- is it possible that 02:48:26  
7 hydrogeological -- localized hydrogeological 02:48:31  
8 features like a ridge can influence the direction of 02:48:38  
9 groundwater flow? 02:48:44  
10 MR. HAGSTROM: Objection. It's compound 02:48:46  
11 and lacks foundation, and it calls for speculation. 02:48:47  
12 THE WITNESS: I honestly don't know what 02:48:56  
13 Mr. Daus testified to, and I specifically don't know 02:48:58  
14 what you mean by "a ridge." Could you explain that 02:49:03  
15 to me? 02:49:06  
16 BY MR. GEE: 02:49:08  
17 Q Okay. 02:49:08  
18 A From a hydrogeologic standpoint, I'm not 02:49:08  
19 quite sure what that means. 02:49:12  
20 Q Okay. Let me explain this from a Six Flags 02:49:13  
21 Magic Mountain perspective. If I'm going down a 02:49:18  
22 roller coaster, there are certain times when you're 02:49:23  
23 going along a straightaway, and then there's a 02:49:28  
24 little elevation incline, if I -- hold on. Let me 02:49:31  
25 strike that and think of a different example. 02:49:42

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1                   Suppose I am a kayaker, and I'm going down                   02:49:47  
2                   the American River and there is a protrusion coming                   02:49:50  
3                   out from the center of the American River, and if                   02:49:57  
4                   I'm going along the groundwater flow -- or the river                   02:50:04  
5                   flow, hopefully the river flow will divert me to --                   02:50:08  
6                   help divert me from going into that mound.                   02:50:13

7                   If there were a similar mound concept,                   02:50:16  
8                   except for that that mound is in the groundwater                   02:50:22  
9                   hydrostatic unit, it has a slightly higher elevation                   02:50:29  
10                  than your -- your surface water -- your surface                   02:50:32  
11                  groundwater flow elevations indicate, would that                   02:50:39  
12                  have -- could that have an influence as to what                   02:50:43  
13                  direction the groundwater would flow?                   02:50:47

14                  MR. HAGSTROM: Calls for speculation.                   02:50:50

15                  Go ahead, Mr. Hokkanen.                   02:50:52

16                  THE WITNESS: I have -- I don't know                   02:50:54  
17                  ridge -- physical ridge that you're referring to or                   02:51:00  
18                  Mr. Daus referred to. So I can't answer that                   02:51:02  
19                  question. I don't know what you're talking about.                   02:51:06  
20                  I honestly don't.                   02:51:08

21                  BY MR. GEE:                   02:51:09

22                  Q       Let's -- let's -- you know, let's not even                   02:51:09  
23                  pretend -- let's not even discuss the specifics of                   02:51:12  
24                  Mr. Daus's opinion.                   02:51:16

25                  If there is a slight -- if there is a                   02:51:21



1       slight inclination in a flow pathway -- groundwater       02:51:23

2       flow pathway, could that have the -- could that have       02:51:30

3       the -- could that result in groundwater flow taking       02:51:34

4       a different direction even if the regional       02:51:39

5       groundwater flow suggests that it should go -- that       02:51:43

6       the groundwater flow could go in the direction of       02:51:46

7       that little ridge or slight -- slightly elevated       02:51:50

8       groundwater level?       02:51:55

9               MR. HAGSTROM: I'm going to say compound.       02:51:58

10              But go ahead, Mr. Hokkanen.       02:52:00

11              THE WITNESS: I'm going to ask the same       02:52:02

12       question, Mr. Gee, and I apologize. But what sort       02:52:05

13       of -- what sort of physical ridge -- subsurface       02:52:08

14       ridge are you referring to? I'm at a bit of a loss.       02:52:14

15       BY MR. GEE:       02:52:17

16              Q       It's a hypothetical, Mr. Hokkanen. Let's       02:52:17

17       say --       02:52:19

18              A       No. I -- seriously, I don't know what       02:52:19

19       you're referring to, a subsurface ridge. A ridge is       02:52:22

20       a -- usually a physical feature above ground.       02:52:27

21              Q       Yes. I'm -- I'm using the analogy for --       02:52:30

22       for, you know, like a -- a slight incline in       02:52:35

23       groundwater elevation in a hydrostatic unit.       02:52:40

24              So let's say that I have -- let's say I       02:52:51

25       have a hydrostatic unit flow pattern which is, let's       02:52:54

1 say, a thousand feet -- a thousand feet above ground 02:52:58  
2 surface, slightly higher to the east, slightly lower 02:53:03  
3 to the -- slightly lower to the west. 02:53:07  
4 But along -- along that -- that pathway, 02:53:11  
5 there is a groundwater contour that is 1,010 feet 02:53:17  
6 above ground level. 02:53:28  
7 Would that groundwater contour -- the 02:53:32  
8 hydrostatic unit contour influence the flow 02:53:34  
9 direction of the groundwater? 02:53:39  
10 MR. HAGSTROM: Objection to the form of the 02:53:42  
11 question as ambiguous. 02:53:44  
12 Go ahead, Mr. Hokkanen. 02:53:46  
13 THE WITNESS: I wish I could. I'll answer 02:53:51  
14 your question this way, sir. I have no indication 02:53:53  
15 at this site that such a situation exists. 02:53:59  
16 And I'd have to look at the -- if you 02:54:06  
17 have -- if you have a situation that I can look at 02:54:08  
18 and look at water levels and the geology, I likely 02:54:10  
19 could try to answer that question, but this 02:54:15  
20 hypothetical I don't really understand. 02:54:17  
21 BY MR. GEE: 02:54:19  
22 Q Okay. I'm not asking you to look at 02:54:19  
23 specific information. 02:54:32  
24 Now, Mr. Hokkanen, taking a look at 02:54:35  
25 groundwater drawings -- and I can look -- let's pull 02:54:42

1 one up for as a -- as an example. That's not it. 02:54:45

2 A Is this a new exhibit? 02:55:05

3 Q No. We're going to take a look at an old 02:55:06

4 exhibit. Let's take a look at Exhibit 318. 02:55:18

5 Mr. Hokkanen, the groundwater contour 02:56:00

6 lines, do they -- are they exactly straight lines or 02:56:03

7 do they have curvatures to them? 02:56:09

8 A It's hard to imagine they're exactly 02:56:11

9 straight lines. They'd tend to kind of wander 02:56:17

10 about. 02:56:20

11 Q Okay. And what would cause them to meander 02:56:23

12 about? 02:56:28

13 A The difference in recharge, differences in 02:56:30

14 the geology, hydraulic conductivity, porosity. 02:56:34

15 Q Okay. And let's talk about hydro -- you 02:56:38

16 said differences in geology. 02:56:45

17 Is that -- did I hear that right is one of 02:56:46

18 the factors? 02:56:49

19 A Yes. 02:56:49

20 Q Okay. 02:56:50

21 A That's a good possibility. 02:56:51

22 Q Okay. What would be -- what impacts and 02:56:52

23 differences in geology have on groundwater flow? 02:56:57

24 A What difference in geology, do you want me 02:57:00

25 to answer? 02:57:05

1 Q Let's say that you had some irregular 02:57:06  
2 geological features where instead of, you know, like 02:57:12  
3 flowing -- instead of having a nice even surface to 02:57:17  
4 flow over, there may be some bumps in a geographical 02:57:21  
5 feature. 02:57:32

6 Would that explain -- partially explain why 02:57:32  
7 these lines aren't exactly straight in part? 02:57:34

8 A Well, I think I answered that question. 02:57:40  
9 There are four or five, six hydrogeologic -- 02:57:42  
10 geologic factors that influence water levels. 02:57:46

11 Q And one of them would be the shape of the 02:57:48  
12 geology? 02:57:53

13 A Shape of the geology, hydraulic 02:57:56  
14 conductivity, porosity, not only the shape of the 02:58:01  
15 geology, meaning the aquifer itself, but how it was 02:58:03  
16 deposited, how it's been shaped over time. There 02:58:06  
17 are many, many factors. 02:58:11

18 Q So is it correct to say it's your opinion 02:58:12  
19 that there are a lot of different factors that -- 02:58:32  
20 that come into play when you're drawing or when it 02:58:35  
21 comes to evaluating groundwater flow direction? 02:58:40

22 A Well, when you're evaluating groundwater 02:58:45  
23 flow direction, the main thing you evaluate are 02:58:48  
24 water levels. 02:58:51

25 Q Okay. And there are a lot of different 02:58:53

1 reasons why water levels can change -- that 02:58:56

2 groundwater levels can change from one point to 02:59:04

3 another along these contortion -- what do you call 02:59:06

4 them iso -- iso-elevation contours? 02:59:09

5 A There are a number of factors, that's 02:59:14

6 correct. 02:59:17

7 Q Okay. Mr. Hokkanen, is there enough 02:59:17

8 information available to accurately draw these 02:59:47

9 contour lines so that -- that -- let me strike that 02:59:58

10 question. 03:00:10

11 On these contour lines, could the elevation 03:00:18

12 difference be significant from one point to another 03:00:21

13 point by 20 feet away? 03:00:26

14 A Could they change? 03:00:29

15 Q Yeah, could it change. Would there be 03:00:33

16 differences in elevation from 20 feet? You would 03:00:38

17 expect there would be unless you get lucky and 03:00:43

18 you're exactly cross-gradient from another well. 03:00:46

19 A If you're upgradient or downgradient, 03:00:49

20 there's going to be a difference. 03:00:54

21 Q And let's say I walk 40 feet away, if I 03:00:56

22 walk another 40 feet away, could there be some 03:01:00

23 hydrogeological explanation as to there even being a 03:01:05

24 more dramatic elevation difference from the point 03:01:11

25 I'm standing on to the point 40 feet away as 03:01:18

1 compared to 20 feet away? 03:01:21

2 MR. HAGSTROM: It's compound, and I believe 03:01:22

3 it calls for speculation. 03:01:24

4 THE WITNESS: I'm sorry to do this, but I 03:01:29

5 always ask a vague -- definitions of vague terms. 03:01:31

6 Dramatic, could you define dramatic to me? 03:01:35

7 BY MR. GEE: 03:01:39

8 Q I'm not saying that -- okay. Let's say 03:01:39

9 that I'm standing -- you know, I'm standing at a 03:01:42

10 certain point and I'm looking at a point that's 03:01:45

11 20 feet away that is one foot higher in elevation 03:01:49

12 from where I'm standing. 03:01:55

13 A Okay. 03:01:58

14 Q Let's say that I walk 40 feet away, like 03:01:59

15 twice the distance. 03:02:04

16 Would there be any reason or would there 03:02:06

17 be -- and it's not instead of one foot, and it's not 03:02:09

18 two foot, but let's say it's three feet higher than 03:02:12

19 where I am today. 03:02:16

20 Is there a hydro -- is there a geological 03:02:20

21 explanation as to why it's not linear? 03:02:24

22 MR. HAGSTROM: Objection; vague. 03:02:29

23 THE WITNESS: I believe I've already 03:02:32

24 answered this question by my count twice. 03:02:34

25 There are a number of reasons water levels 03:02:37

1 change. Water levels change over distance. You 03:02:41  
2 could have changes in hydraulic conductivity. You 03:02:46  
3 could be nearer a recharge zone. 03:02:50  
4 One of the most common things that I see is 03:02:52  
5 that you have wells that are screened at different 03:02:56  
6 elevations. And if you have vertical gradients in 03:02:59  
7 aquifers, two wells right next to each other 03:03:03  
8 screened at different levels will have different 03:03:06  
9 water levels. There are a lot of different reasons 03:03:09  
10 for what you just described. 03:03:13  
11 MR. GEE: How are we doing on -- does 03:03:51  
12 anybody need a break right now or are we good 03:03:52  
13 continuing? 03:03:55  
14 THE REPORTER: I just need a five-minute 03:03:57  
15 break to get some water. 03:03:59  
16 MR. GEE: Should we take five minutes? 03:04:00  
17 MR. HAGSTROM: Good idea. 03:04:03  
18 MR. GEE: Okay. 03:04:04  
19 THE VIDEOGRAPHER: We're going off the 03:04:05  
20 record at 3:03. 03:04:06  
21 (Recess taken.) 03:13:56  
22 THE VIDEOGRAPHER: We are back on the 03:13:56  
23 record. The time is 3:13. Please proceed. 03:13:57  
24 BY MR. GEE: 03:14:01  
25 Q Mr. Hokkanen, just so I'm not surprised at 03:14:01

1 trial, is it your opinion that the hydrogeological 03:14:04  
2 characteristics beneath the Whittaker-Bermite site 03:14:13  
3 are complicated? 03:14:16

4 A The site and the area around the site have 03:14:18  
5 been characterized as what we called heterogeneous, 03:14:23  
6 which means from our standpoint the same thing, yes, 03:14:28  
7 it's complicated. 03:14:31

8 Q And is it your opinion that, you know, 03:14:36  
9 again, just trying make a record so I don't get 03:14:39  
10 surprised at trial, it's your opinion that it's 03:14:42  
11 impossible for any contamination from OU-3 and OU-4 03:14:48  
12 to leave the Whittaker-Bermite site without going 03:14:52  
13 through the western portion of OU-4? 03:14:55

14 A Based on my analysis, if VOCs are leaving 03:15:00  
15 the main part of the Bermite site, they would go 03:15:04  
16 through the western boundary of OU-4, that's 03:15:07  
17 correct. 03:15:10

18 Q Okay. Just make -- make it clear that your 03:15:13  
19 opinion is that it is impossible for VOCs to leave 03:15:18  
20 from -- OU-4 and OU-3 to leave the Whittaker-Bermite 03:15:22  
21 site from the area north of OU-4? 03:15:28

22 MR. HAGSTROM: I'm going to object to the 03:15:35  
23 form of the question. 03:15:37

24 But go ahead, Mr. Hokkanen. 03:15:37

25 THE WITNESS: If you could clarify that a 03:15:39



1 little. From OU-5, is that what you mean? 03:15:46

2 BY MR. GEE: 03:15:48

3 Q Well, what we're talking about is 03:15:48

4 groundwater -- VOC contamination from OU-3 and OU-4. 03:15:50

5 Is your opinion from VOC contamination from 03:15:56

6 OU-3 and OU-4 -- strike that. 03:16:00

7 Is it your opinion that it is impossible 03:16:03

8 for VOC contamination located in OU-3 and OU-4 to 03:16:06

9 leave the Whittaker-Bermite site through the area of 03:16:12

10 north OU-4? 03:16:18

11 A Ms. Stanin and Dr. Trudell, they had an 03:16:21

12 opinion that it moved through the northern boundary 03:16:27

13 of OU-4. 03:16:29

14 Is that -- is that what you're suggesting? 03:16:32

15 Q Yes. 03:16:34

16 A Based on my analysis, one, it doesn't 03:16:36

17 appear that it did, and, two, if -- if it moved 03:16:38

18 through the northern boundary of OU-4, it would not 03:16:42

19 skip the western boundary of OU-4, that it would -- 03:16:47

20 that it would move through the western boundary of 03:16:51

21 OU-4. 03:16:55

22 Q Okay. But is it your testimony that it's 03:16:55

23 impossible -- impossible to move through the 03:16:58

24 northern boundary of OU-4? 03:17:00

25 MR. HAGSTROM: Objection -- 03:17:05

1 THE WITNESS: Go ahead. 03:17:06

2 MR. HAGSTROM: -- asked and answered. 03:17:06

3 THE WITNESS: I can repeat my answer. My 03:17:13

4 opinion is that based on my analysis of the data -- 03:17:15

5 now are you referring to VOCs or are you referring 03:17:21

6 to --

7 BY MR. GEE: 03:17:26

8 Q VOCs. 03:17:26

9 A VOCs. Based on the data I have available 03:17:28

10 to me, one, it doesn't appear that they have moved 03:17:30

11 through that pathway, as it's been put, and if it 03:17:34

12 did, it would move through the western boundary of 03:17:37

13 OU-4, and the data shows that it hasn't. 03:17:42

14 Q Is it your opinion that is impossible for 03:17:47

15 contamination from OU-3 and OU-4 to leave through 03:17:52

16 the southern boundary of OU-4? 03:17:59

17 MR. HAGSTROM: I'm going to object to the 03:18:03

18 form of the question. 03:18:05

19 THE WITNESS: Basically you have the 03:18:06

20 same -- the same answer. Based on my analysis of 03:18:09

21 the data, two things. It doesn't appear that there 03:18:13

22 is a VOC plume moving south of OU-4 based on the 03:18:15

23 data, and if it did, you would see VOCs on the 03:18:22

24 western boundary of OU-4. 03:18:27

25 BY MR. GEE: 03:19:24

1 Q Okay. Mr. Hokkanen, are you saying -- that 03:19:24  
2 is it your opinion that there is -- is it your 03:19:26  
3 opinion that there is sufficient data on the north 03:19:33  
4 boundary of OU-4 to make a conclusion that it is 03:19:39  
5 impossible for contamination to move in that 03:19:48  
6 direction? 03:19:52  
7 MR. HAGSTROM: Excuse me, Mr. Hokkanen. 03:19:55  
8 I'm going to object to the form of the question. 03:19:57  
9 But go ahead. 03:19:59  
10 BY MR. GEE: 03:20:17  
11 Q Mr. Hokkanen. 03:20:17  
12 A Did Earl finish what he was saying? 03:20:18  
13 MR. HAGSTROM: I did. Sorry. 03:20:20  
14 THE WITNESS: Oh, I'm sorry. I didn't hear 03:20:21  
15 that. 03:20:23  
16 MR. SINCLAIR: I couldn't hear him either. 03:20:25  
17 MR. HAGSTROM: Madam Court Reporter, did 03:20:30  
18 you get the objection? 03:20:33  
19 THE REPORTER: Yes, I did.  
20 MR. SINCLAIR: No, you went silent. 03:20:37  
21 MR. HAGSTROM: She got -- let's stop for a 03:20:39  
22 second. The court reporter got my objection. If 03:20:42  
23 anybody wants to hear it, they can have it read 03:20:42  
24 back. 03:20:45  
25 (The record was read as follows:

1 "MR. HAGSTROM: I'm going to object  
2 to the form of the question.")  
3 THE WITNESS: Thank you. The question was 03:20:55  
4 on the southern -- sort of what's called the 03:20:59  
5 southern road, is that what we're talking about? 03:21:04  
6 BY MR. GEE: 03:21:06  
7 Q We're going back to the northern route. 03:21:06  
8 A Okay. 03:21:11  
9 Q Mr. Hokkanen, is it your opinion that you 03:21:12  
10 have enough contamination data north of the OU-4 03:21:17  
11 borderline to definitively opine that VOC 03:21:26  
12 contamination from OU-3 and OU-4 cannot be passing 03:21:32  
13 through the northern borderline of OU-4? 03:21:36  
14 A That's basically what my opinion in four 03:21:40  
15 says. So based on the data that I have available to 03:21:45  
16 me and that I've reviewed, that's my opinion, that 03:21:50  
17 it -- VOCs have not migrated off the Bermite site. 03:21:53  
18 Q Okay. My question is a little bit 03:22:02  
19 different, though. 03:22:03  
20 My question is: It is your opinion that 03:22:05  
21 you have sufficient groundwater monitoring data 03:22:08  
22 north of OU-4 to definitively determine that it is 03:22:12  
23 impossible for contamination from OU-3 and OU-4 to 03:22:18  
24 pass through the northern border of OU-4? 03:22:24  
25 MR. HAGSTROM: Object to the form of the 03:22:28

1 question. He's asked and answered that. 03:22:29

2 Go ahead, Mr. Hokkanen. 03:22:32

3 THE WITNESS: I'll answer it in two parts. 03:22:33

4 The first part I testified this morning that we 03:22:36

5 always, as scientists, hydrogeologists, would like 03:22:40

6 more data. Based on the data that I had available 03:22:45

7 to me, yes, I drew the conclusion that VOCs have not 03:22:48

8 migrated to the water agency wells. 03:22:52

9 BY MR. GEE: 03:23:01

10 Q And if CW-1 did not exist, would you have 03:23:01

11 had enough data to make that opinion? 03:23:04

12 MR. HAGSTROM: Calls for speculation -- 03:23:07

13 calls for speculation. 03:23:09

14 THE WITNESS: Would I have enough data? 03:23:09

15 Well, again, the other data that I considered was 03:23:13

16 the SG-1 wells and the contamination in 3a that we 03:23:16

17 looked at, if it were moving through the northern 03:23:25

18 boundary to Saugus-1 should show up in HSU-3a, and 03:23:31

19 HSU-3a has not detected VOCs. They're century 03:23:39

20 wells. That's what they were put there for. 03:23:48

21 BY MR. GEE: 03:23:56

22 Q Okay. Let me ask you, just so I don't get 03:23:56

23 surprised at trial, is it your opinion that you have 03:23:58

24 enough groundwater monitoring contamination data to 03:24:02

25 the south of OU-4 to definitively opine that VOC 03:24:11

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1       contamination is not leaving through the southern       03:24:21  
2       boundary line of OU-4?       03:24:24  
3           A       The southern boundary line, well, again,       03:24:29  
4       the opinion that I rendered and which I will render       03:24:35  
5       in trial is my opinion four and five which deals       03:24:39  
6       with 201 and 205, that VOCs from the Bermite site       03:24:42  
7       have not impacted the water agency wells.       03:24:48  
8           Q       Okay. So your testimony is that does not       03:25:05  
9       have anything to do with whether or not you have       03:25:11  
10       sufficient data to make a determination that VOC       03:25:15  
11       contamination is migrating to the south of OU-4?       03:25:19  
12           A       That VOCs are migrating south?       03:25:27  
13               MR. HAGSTROM: Hang on. I didn't know if       03:25:31  
14       Mr. Gee was finished with his question. Excuse me.       03:25:33  
15               Sorry. Can I have the question read back,       03:25:40  
16       please.       03:25:43  
17               (The record was read as follows:  
18               "Q       So your testimony is that does  
19               not have anything to do with  
20               whether or not you have sufficient  
21               data to make a determination that  
22               VOC contamination is migrating to  
23               the south of OU-4?")       03:25:58  
24               MR. HAGSTROM: I'm going to object. It's       03:25:58  
25       vague and compound.       03:25:59

1                   Go ahead.                   03:26:02

2                   THE WITNESS: Mr. Gee, what I did is I used           03:26:08

3                   the available information to draw my conclusions,           03:26:10

4                   and there are wells south of OU-4 that I looked at           03:26:13

5                   the data over the period of record, and I based my           03:26:20

6                   opinion on that data.                   03:26:25

7                   BY MR. GEE:                   03:26:40

8                   Q       All right. Mr. Hokkanen, let's move on to           03:26:40

9                   your opinion number five.                   03:26:44

10                  Okay. Mr. Hokkanen, in your expert report,       03:27:43

11                  Figure 3 or, Earl, for your convenience, it's PDF     03:27:47

12                  Figure 135.                   03:27:53

13                  A       I'm there.                   03:28:19

14                  Q       Mr. Hokkanen, what does this figure           03:28:20

15                  represent?                   03:28:23

16                  A       This is a representation that was presented     03:28:23

17                  in the CH2M Hill 2004 modeling study of the capture     03:28:30

18                  zones of the Saugus production wells.           03:28:36

19                  Q       And at what rate was Saugus-1 pumping?       03:28:40

20                  A       In this particular model run?           03:28:48

21                  Q       Yes.                   03:28:54

22                  A       I don't have that memorized in the report.     03:28:54

23                  I apologize.                   03:28:57

24                  Q       What rate was Saugus-2 pumping at?           03:28:57

25                  A       I don't remember any of the rates, sir.       03:29:00

1 Q Wouldn't it be important to know what the 03:29:03  
2 rates are to determine whether or not -- well, let 03:29:06  
3 me strike that question. 03:29:14  
4 Doesn't capture zone figures -- didn't 03:29:15  
5 capture zone figures change dramatically depending 03:29:22  
6 on what rates of wells pumping -- and let me give 03:29:25  
7 you an example. Let's say we shut down Saugus-1. 03:29:29  
8 Will this figure be the same? 03:29:32  
9 A Nope. 03:29:34  
10 Q And let's say we shut down Saugus-2. Would 03:29:34  
11 this figure be the same? 03:29:37  
12 A The flow would be different. 03:29:39  
13 Q And let's say I cut flow rate down for 03:29:42  
14 Saugus-1 in half. 03:29:48  
15 Would this still be the same -- would we 03:29:49  
16 still see the same containment lines? 03:29:52  
17 A I'll generalize your question. If you 03:29:54  
18 change the rate of any of these wells, you would 03:29:57  
19 have different capture zones. How dramatic would it 03:30:00  
20 be? Well, that depends on how much you change the 03:30:06  
21 rate. 03:30:09  
22 Q All right. And the 2004 study, I think you 03:30:09  
23 mentioned it was a containment study? 03:30:16  
24 A I believe so, yes. 03:30:20  
25 Q And at the time -- I think I remember 03:30:22



1 this -- this figure, do you know whether or not the 03:30:29  
2 objective of the report or one of the objectives of 03:30:37  
3 the report was to determine whether or not you 03:30:43  
4 pumped Saugus-1 and Saugus-2 in a manner that would 03:30:49  
5 prevent contamination from the Whittaker-Bermite 03:30:53  
6 site migrating to V-201? 03:30:57

7 MR. HAGSTROM: Object. It's vague and 03:31:01  
8 ambiguous as to what contamination. 03:31:03

9 MR. GEE: Let's say perchlorate 03:31:08  
10 contamination. 03:31:16

11 MR. HAGSTROM: All right. 03:31:17

12 THE REPORTER: What kind of contamination? 03:31:19

13 MR. GEE: Perchlorate. 03:31:20

14 THE REPORTER: Oh, perchlorate. 03:31:20

15 THE WITNESS: I believe you asked me a 03:31:20

16 couple of different variations. I don't remember 03:31:23

17 the exact purpose. I believe it's -- the purpose 03:31:25

18 was to look at the containment of the perchlorate 03:31:30

19 plume to see if Saugus-1 and 2 would indeed contain 03:31:33

20 the perchlorate plume, would it capture the 03:31:37

21 perchlorate plume. That's what I remember. 03:31:42

22 BY MR. GEE: 03:31:44

23 Q All right. And so if the answer to that 03:31:44

24 question was yes, would you expect that a drawn line 03:31:52

25 to your Figure 30 would support a conclusion that 03:31:57

1 pumping Saugus-1 and Saugus-2 could indeed prevent 03:32:02  
2 perchlorate from the Whittaker-Bermite site from 03:32:09  
3 being drawn into V-201? 03:32:12  
4 MR. HAGSTROM: It's outside of the scope. 03:32:17  
5 THE WITNESS: I really didn't look at that 03:32:22  
6 question, sir. That wasn't part of my analysis, but 03:32:24  
7 based on these capture zones, that tends to what it 03:32:26  
8 shows, yes. It appears that 201 is drawing water 03:32:31  
9 from the south of its location. 03:32:35  
10 BY MR. GEE: 03:32:37  
11 Q Okay. And so, Mr. Hokkanen, do you know if 03:32:37  
12 this is -- what type of model is being used to 03:32:49  
13 generate this figure? 03:32:52  
14 A I believe -- this is from memory -- I 03:32:59  
15 believe they used a version of MODFLOW, but I'd have 03:33:04  
16 to go back --  
17 THE REPORTER: I'm sorry. A version of  
18 what?  
19 THE WITNESS: I think it was MODFLOW.  
20 THE REPORTER: A version of what?  
21 THE WITNESS: M-O-D-F-L-O-W.  
22 BY MR. GEE: 03:33:09  
23 Q Okay. So this is not a particle tracking 03:33:09  
24 map; is that correct? 03:33:19  
25 A This one? 03:33:20

1 Q Yes. 03:33:21

2 A Yes, it is, yes. 03:33:21

3 Q Okay. Now, Mr. Hokkanen, you opined that 03:33:22

4 the V-201 well -- or that the Whittaker-Bermite site 03:33:36

5 is not within the capture zone of V-201, is that -- 03:33:41

6 was that your opinion? 03:33:47

7 A Based on this pumping scenario, that's 03:33:49

8 correct, yes. 03:33:54

9 Q Okay. You are aware, of course, 03:33:56

10 Mr. Hokkanen, that Saugus-1 and Saugus-2 were shut 03:33:58

11 down between 1997 and 2010, 2011-ish time frame? 03:34:01

12 A Yes. 03:34:08

13 Q Would the capture zone for V-201 be 03:34:08

14 different during that time period than what's 03:34:17

15 depicted in this drawing? 03:34:19

16 A Yes. 03:34:20

17 Q And have you evaluated how different it 03:34:20

18 would be? 03:34:25

19 A I have not modeled this system, no. 03:34:26

20 Q Other than looking at this drawing, what 03:34:28

21 other analysis did you do to determine that the 03:34:40

22 Whittaker-Bermite site is not within the capture 03:34:45

23 zone V-201? 03:34:47

24 A Is not within the capture zone of V-201? 03:34:52

25 Q Yes. 03:34:56

1           A     I looked at other modeling that's been           03:34:56  
2           done, and as I testified to earlier, depending on       03:35:00  
3           the parameters you use and the assumptions you make,   03:35:05  
4           I have seen some model runs that show V-201           03:35:08  
5           capturing water from the Bermite site. The model       03:35:12  
6           capture zones that I've looked at vary considerably.   03:35:21  
7           Q     Okay. So is it your opinion that in some       03:35:24  
8           models, that the Whittaker-Bermite site is within       03:35:32  
9           the capture zone V-201?                               03:35:35  
10          A     Based on some of the model runs that I've       03:35:37  
11          seen, based on the run, yes.                           03:35:42  
12          Q     And is there a reason that you dismiss       03:35:50  
13          those model runs, if you did dismiss those modeling   03:35:52  
14          runs, that showed the capture zone of V-201 being --   03:35:56  
15          including the Whittaker -- capturing contamination   03:35:59  
16          from the Whittaker-Bermite site?                       03:36:03  
17          A     There wasn't a particular reason, no. I       03:36:06  
18          think I used this because the VOC report used this   03:36:10  
19          one, and it was a classic model of these capture       03:36:14  
20          zones, and as I testified, depending on the           03:36:20  
21          conditions -- the parameters you used and the       03:36:23  
22          assumptions you make, the capture zones vary quite a   03:36:25  
23          bit.   03:36:29  
24          Q     Okay. So other than using this drawing,       03:36:29  
25          what other analysis did you do to -- to determine       03:36:33

1 that VOC contamination could not reach V-201 because 03:36:39  
2 it's not in the capture zone of the well? 03:36:47  
3 A I think as we've talked about at length, I 03:36:55  
4 examined and analyzed the water quality data 03:36:58  
5 collected at the Bermite site. 03:37:03  
6 In my opinion, it hasn't migrated basically 03:37:08  
7 off the site. It hasn't moved through the western 03:37:11  
8 boundary of OU-4. If it hasn't moved through the 03:37:14  
9 western boundary of OU-4, V-201, for example, is a 03:37:16  
10 good -- over a mile away from the western boundary. 03:37:20  
11 So my conclusion was based on that 03:37:24  
12 analysis, that it didn't impact 201 or 205. I also 03:37:27  
13 subsequently looked at first detections of 03:37:37  
14 perchlorate and TCE in the wells V-201 and V-205. I 03:37:40  
15 also looked at century data for monitoring in the 03:37:45  
16 area to draw that conclusion. 03:37:49  
17 Q Okay. Mr. Hokkanen, in your opinion, I 03:37:53  
18 believe it's four, you calculated -- you calculated 03:37:57  
19 a retardation rate, did you not, for TCE? 03:38:02  
20 A I didn't calculate a rate. What I used was 03:38:08  
21 the exhibit with the orange perchlorate data, and I 03:38:13  
22 used that as an example of approximating a 03:38:20  
23 retardation of the TCE versus the perchlorate. 03:38:24  
24 Q Okay. So you basically used groundwater -- 03:38:27  
25 groundwater sampling data to deduce a migration rate 03:38:33

1 for PCE; is that accurate? 03:38:40

2 A Yes. 03:38:43

3 Q And you did the same for TCE? 03:38:44

4 A That would be a very good way to do it. I 03:38:46

5 did it for TCE, yes. 03:38:49

6 Q And then didn't you use the migration rate 03:38:51

7 to determine how far PCE and TCE -- or PCE would 03:38:57

8 migrate at the site? 03:39:04

9 A I don't believe I did that, no. 03:39:05

10 Q Okay. 03:39:07

11 A If you can show me that in my expert 03:39:08

12 report. 03:39:10

13 Q Okay. 03:39:10

14 A Okay. What I did is I used -- excuse me. 03:39:11

15 I'm sorry. I wasn't finished. 03:39:14

16 Q Yeah, I'm sorry. My apologies. 03:39:15

17 A I don't remember what exhibit it was, but 03:39:18

18 the one with the orange showing the extent of the 03:39:21

19 perchlorate, I used that as a tracer because 03:39:25

20 perchlorate migrates essentially at the same rate as 03:39:29

21 groundwater. 03:39:34

22 Then I looked at how far that migrated, and 03:39:35

23 I looked at how far TCE migrated, and I had very 03:39:37

24 direct comparison to figure out how far -- what the 03:39:43

25 retardation rate of TCE is using the perchlorate 03:39:49

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1 plume. 03:39:53

2 If one calculates a retardation factor 03:39:54

3 there are factors in that calculation that haven't 03:39:56

4 been measured at this site. You basically have to 03:40:00

5 use literature data. 03:40:03

6 Now, when you have water quality data that 03:40:07

7 can give you an approximation of the retardation, 03:40:09

8 that's a very good way to calculate that. 03:40:11

9 Q Okay. Let's see. I have to look at the 03:40:17

10 exhibits, make sure they weren't previously 03:41:15

11 introduced. I'm just trying to make a clean record. 03:41:18

12 Mr. Hokkanen, I think it's -- I think it's 03:41:31

13 319, but for whatever new exhibit just popped up, if 03:41:35

14 you could open that up. 03:41:42

15 A I have it, sir. 03:41:47

16 (The document referred to was marked by the

17 Reporter as Deposition Exhibit 319 for

18 identification and is attached hereto.)

19 BY MR. GEE: 03:41:48

20 Q I wish this were a clearer picture because, 03:41:48

21 as I get older, I not only get more nearsighted, but 03:42:00

22 my color distinction goes away a little bit more. 03:42:04

23 Mr. Hokkanen, this is one of probably many 03:42:08

24 zone of influence maps that was created for V-201 03:42:15

25 and V-205 -- actually it was just V-201. I don't 03:42:20

1 think there was any -- any capture zone lines for 03:42:26

2 V-205. So let's just say to me it appears that this 03:42:35

3 is just for V-201 as well as Saugus-1 and Saugus-2. 03:42:38

4 MR. HAGSTROM: Byron, go ahead. I'll wait 03:42:43

5 until you finish. My apologies. 03:42:46

6 BY MR. GEE: 03:42:48

7 Q Okay. Mr. Hokkanen, you indicated that one 03:42:48

8 of the other lines of evidence that you considered 03:42:56

9 was that none of the contour lines for V-201 -- or 03:43:02

10 capture lines for V-201 -- or the capture lines for 03:43:13

11 V-201 pass by the western -- the western borderline 03:43:18

12 of OU-4; is that correct? 03:43:24

13 A I don't believe I testified to that, no, I 03:43:28

14 don't believe I said that. 03:43:33

15 Q Okay. 03:43:35

16 A I said that I have seen model runs that 03:43:35

17 show capture zones for V-201 that intersect the 03:43:42

18 Bermite site. 03:43:47

19 Q Okay. And this particular drawing, does it 03:43:53

20 show that the capture zone for V-201 do indeed 03:43:56

21 capture groundwater as -- groundwater contamination 03:44:01

22 from the Whittaker-Bermite site? 03:44:06

23 A Does it show that flow lines from the 03:44:12

24 Bermite site go to V-201, is that your question? 03:44:15

25 Q I asked it in another way. Does -- does 03:44:19



1 the capture zone line from V-201 extend to the 03:44:22  
2 Whittaker-Bermite site, but I don't know if it's any 03:44:27  
3 different than the rephrased question that you 03:44:31  
4 presented but -- 03:44:33

5 A Well, I'll preface my answer by saying, I 03:44:38  
6 have no idea what model run this was or what they 03:44:43  
7 were looking at or flow rates or anything, but if 03:44:47  
8 you're asking me what this particular figure shows. 03:44:50

9 And I've seen other figures like this 03:44:53  
10 different consultants that have modeled this area, 03:44:56  
11 it appears that flow lines from particularly it 03:44:59  
12 looks like the southern-most portion of the Bermite 03:45:05  
13 site go to 201. 03:45:09

14 Q Okay. 03:45:14

15 MR. HAGSTROM: Byron, can you tell me where 03:45:14  
16 this is from before you ask another question. 03:45:18

17 MR. GEE: This was from a modeling database 03:45:20  
18 produced by AECOM pursuant to a subpoena. 03:45:27

19 MR. HAGSTROM: Okay. Thank you. 03:45:33

20 BY MR. GEE: 03:45:42

21 Q Okay. Mr. Hokkanen, does this document 03:45:42  
22 show that it's the V-201 zone of influence or 03:45:45  
23 whatever you called the lines passes along the 03:45:51  
24 western portion of OU-3? 03:45:58

25 A Oh, the western portion of OU-3, yeah, 03:46:00

1       that's where it intersects the Bermite site, that's       03:46:06  
2       correct.       03:46:09  
3           Q       Isn't there monitoring wells on the western       03:46:09  
4       portion of OU-3 that have -- that has -- well,       03:46:15  
5       within the last three years had TCE concentrations       03:46:21  
6       that were a hundred times the MCL?       03:46:27  
7           A       I can't remember the concentrations. You       03:46:31  
8       may be correct, and there are wells along the       03:46:34  
9       western boundary of OU-3 that show VOCs, yes.       03:46:40  
10          Q       Okay. So just assuming that this is --       03:46:46  
11       that this is a representative capture zone map,       03:46:50  
12       would it be plausible that VOC contamination from       03:47:00  
13       the Whittaker-Bermite site could be pulled into       03:47:05  
14       V-201?       03:47:11  
15               MR. HAGSTROM: Objection. It's ambiguous       03:47:11  
16       incomplete.       03:47:13  
17               THE WITNESS: Again, based on V-201 --       03:47:19  
18       excuse me -- based on these -- I really don't know       03:47:24  
19       what this is all based on. If you're asking me if       03:47:29  
20       flow lines from Bermite go to V-201, I already       03:47:33  
21       answered that they do, yes.       03:47:39  
22       BY MR. GEE:       03:47:41  
23          Q       Okay. And you also answered the question       03:47:41  
24       of whether these lines intersect areas from the       03:47:47  
25       Whittaker-Bermite site that do contain VOCs; is that       03:47:51

1 correct? 03:47:55

2 A Western boundary of OU-3 does -- monitoring 03:47:55

3 data shows it contains VOCs, yes. 03:48:00

4 Q Okay. So hypothetically if this is a 03:48:03

5 legitimate model, is it -- is it possible that VOC 03:48:08

6 contamination from the Whittaker-Bermite site can be 03:48:16

7 pulled into V-201? 03:48:19

8 A Well, I -- if you look at my opinion five, 03:48:21

9 I said no. Based on my analysis of the water 03:48:27

10 quality data, my answer was no. 03:48:30

11 Q Okay. Didn't you say your opinion was 03:48:36

12 based on Figure 30 in your report? 03:48:40

13 A In part. 03:48:48

14 Q And I'm sorry. My memory is going as we 03:48:50

15 go -- as we go along here. 03:48:53

16 What line of evidence did you consider? 03:48:55

17 A I considered all the water quality data 03:49:00

18 that's been collected out here. 03:49:03

19 Q Okay. And what water quality data did you 03:49:04

20 look at between the western border of OU-3 and 03:49:08

21 V-201? 03:49:16

22 A Well, there is a well at OS-MW-01, a well 03:49:18

23 nest, I believe, is in that facility, and that shows 03:49:25

24 very little -- it shows a couple of VOC detections, 03:49:28

25 but not much. 03:49:31

1 In addition -- and let me put it this way. 03:49:35

2 The distance from the western boundary of OU-3 to 03:49:38

3 V-201 is much, much, much greater than it is from 03:49:42

4 the OU-3 area through the western boundary of OU-4. 03:49:46

5 And if you look at the data from the source 03:49:53

6 areas in OU-2, OU-3, it hasn't reached the western 03:49:56

7 boundary of OU-4. Given the greater distance to 03:50:00

8 201, it wouldn't have reached 201 by this point. 03:50:07

9 Q Are there contour lines from V-201 that do 03:50:11

10 not intersect the western border of OU-4 that reach 03:50:17

11 the western border of OU-3? 03:50:21

12 A I'm sorry. Could you repeat that, sir? 03:50:28

13 You fuzzed out just for a moment. 03:50:31

14 Q All right. My question is: Are there 03:50:33

15 contour lines going from the west of OU-3 to V-201 03:50:37

16 that do not pass through the western border of OU-4? 03:50:44

17 A Yes, based on this modeling run that I have 03:50:53

18 no idea what it is, but yes. 03:50:57

19 Q Okay. And one of the wells we talked about 03:51:01

20 earlier appeared to be -- monitoring wells appeared 03:51:03

21 to be close to NC-13. 03:51:06

22 Do some of the contour lines from the 03:51:09

23 Whittaker-Bermite site to V-201 not pass through 03:51:12

24 NC-13 or -- 03:51:19

25 A I'm sorry. I'm having a tough time 03:51:24

1 following your questions, and it's my fault. I'm 03:51:27  
2 sorry. Could you repeat that? 03:51:29  
3 Q Okay. It might be my fault. I'm talking 03:51:30  
4 as loud as I can. 03:51:33  
5 Now, one of the monitoring wells that you 03:51:38  
6 referenced before south of the Whittaker-Bermite 03:51:42  
7 site is next to NC-13, and I'm using it as a 03:51:46  
8 reference point. 03:51:52  
9 Do you see any of these contour lines from 03:51:53  
10 the Whittaker-Bermite site to the western border of 03:52:00  
11 OU-3 that do not pass by NC-13? 03:52:09  
12 MR. HAGSTROM: Objection; lacks foundation. 03:52:14  
13 He's never seen this before. 03:52:15  
14 Go ahead, Mr. Hokkanen. 03:52:17  
15 THE WITNESS: Well, if you're asking me -- 03:52:21  
16 I think -- well, I believe you've asked this in a 03:52:23  
17 different way, but these are -- first of all, 03:52:27  
18 they're not contour lines. They're particle trace 03:52:30  
19 lines. 03:52:34  
20 And if you're asking me are there particle 03:52:37  
21 trace lines that move from the western boundary of 03:52:40  
22 OU-3 to V-201, is that what you're asking me, sir. 03:52:43  
23 BY MR. GEE: 03:52:47  
24 Q Yes, V-201. 03:52:47  
25 A I think I've answered that three times, but 03:52:49

1 based on this figure, yes, it appears that -- based 03:52:51  
2 on this figure, yes. 03:52:55

3 Q Okay. The prior question was: Does it 03:52:56  
4 pass by the western border of OU-4, and now I'm 03:52:58  
5 asking are there contour lines that do not pass by 03:53:02  
6 the monitoring wells to the south of OU-4. 03:53:07

7 A Well, some do and some don't, but as I 03:53:12  
8 testified before, I want to say this again, based on 03:53:17  
9 my review of all of the data, meaning the water 03:53:23  
10 level data, the flow data which is based on the 03:53:28  
11 water level data and the water quality data, 03:53:33  
12 contaminants don't move along these little lines. 03:53:33

13 This is not a representation of reality. 03:53:37  
14 You can see it in the perchlorate plume that we've 03:53:42  
15 looked at. If you look at the TCE plume that's 03:53:45  
16 coming off of OU-2 and OU-3, you end up with a 03:53:47  
17 pretty wide plume, and so you can't pick an 03:53:52  
18 individual line and say, uh-huh, TCE is moving on 03:53:56  
19 that line. That's not how it works at this site. 03:53:59

20 Q Okay. Mr. Hokkanen, is it your testimony 03:54:20  
21 that -- okay. 03:54:22

22 Just so I'm not surprised at trial, is it 03:54:28  
23 your testimony that there are no contour lines -- or 03:54:31  
24 there are no particle tracking lines from V-201 to 03:54:36  
25 the west portion of OU-3 that can be a plausible 03:54:46

1 pathway for VOC contamination to impact V-201? 03:54:59

2 MR. HAGSTROM: Objection. It's compound, 03:55:07

3 calls for speculation. 03:55:09

4 THE WITNESS: Well, my ex -- what my 03:55:12

5 opinion five said is -- I didn't speak about 03:55:19

6 plausible pathways. What my opinion five stated is 03:55:21

7 that VOCs from the Bermite site have not reached 201 03:55:25

8 and 205. 03:55:30

9 Is there -- let's -- let me add to that, 03:55:33

10 those two wells have detected perchlorate, 03:55:37

11 relatively recently, but they've detected 03:55:42

12 perchlorate. 03:55:45

13 Perchlorate came from the Bermite site, and 03:55:46

14 so is there plausible pathway? Well, it appears 03:55:51

15 that there is a pathway. The question that I 03:55:55

16 answered was are the VOCs that have been detected in 03:55:59

17 V-201 and 205 from the Bermite site, and based on my 03:56:03

18 analysis, no. 03:56:07

19 BY MR. GEE: 03:56:08

20 Q Okay. All right. Just to make the record 03:56:08

21 straight, what -- what -- what part of your analysis 03:56:22

22 did rely on Figure 30 in your expert report? 03:56:31

23 A I'm sorry. Which one was Figure 30? Was 03:56:34

24 that the -- 03:56:37

25 Q That was the containment particle tracking 03:56:37

1	lines --	03:56:40
2	A Okay.	03:56:41
3	Q -- from the 2004 report.	03:56:42
4	A Well, what Figure 30 shows is when all the	03:56:44
5	wells are pumping, based on that model run, that's	03:56:47
6	where the capture zone for V-201 was.	03:56:50
7	Q Okay. And that's all that you can --	03:56:56
8	that's all you concluded from Figure 30 or is there	03:56:58
9	other conclusions that --	03:57:02
10	A Well, that's what it shows. It shows when	03:57:02
11	the wells are pumping, based on all that -- on that	03:57:04
12	model run, that the capture zone for V-201 is to the	03:57:08
13	south. Like I testified several times now, there	03:57:14
14	are a lot of different model runs out there that	03:57:17
15	show different things.	03:57:20
16	Q Okay. Mr. Hokkanen, I believe in opinion	03:57:35
17	five, even though it's not expressly written in your	03:57:37
18	opinion, that you mention the higher concentration	03:57:41
19	of VOCs in the lower hydrostatic units going farther	03:57:46
20	away from the Whittaker-Bermite site being at higher	03:57:57
21	concentrations in the lower hydrostatic is evidence	03:58:00
22	that there was another source of VOCs?	03:58:04
23	A Yes.	03:58:07
24	Q And what other supporting evidence do you	03:58:07
25	have that there were other sources of VOC	03:58:13



1 contamination impacting -- impacting the lower 03:58:19  
2 hydrostatic units in the Saugus Formation? 03:58:22  
3 A In that -- in that area, in that area of 03:58:25  
4 V-201 and 205? 03:58:28  
5 Q Yes. 03:58:30  
6 A Other than the monitoring well data? 03:58:30  
7 Q Yes. 03:58:34  
8 A Okay. If you'll look at the arrival times 03:58:36  
9 of perchlorate in TCE in V-201 and 205, that would 03:58:40  
10 also indicate the potential for other sources. 03:58:46  
11 Q Okay. Now, earlier you indicated that the 03:58:48  
12 hydrostatic units that were defined in -- or the 03:58:59  
13 CH2M Hill studies are hydraulically connected at 03:59:07  
14 some point. 03:59:14  
15 Do you remember that? 03:59:15  
16 A Yes, they appear to be to a certain extent, 03:59:15  
17 yes. 03:59:18  
18 Q Okay. And if we had VOCs, which are 03:59:18  
19 heavier than water, flowing outward from the 03:59:26  
20 Whittaker-Bermite site out to the wells near V-201 03:59:32  
21 and V-205, wouldn't the VOCs tend to be heavier and 03:59:37  
22 migrate down closer to the bottom of the hydrostatic 03:59:44  
23 units? 03:59:49  
24 A No. 03:59:49  
25 Q And you're saying no. Pretend this is a 03:59:49

1 law school examination. Please explain. 03:59:58

2 A A chemical, whether in its pure form is 04:00:01

3 heavier or lighter than water. When it's dissolved 04:00:08

4 in water, it moves with the groundwater. That 04:00:12

5 particular molecule of TCE doesn't -- it doesn't 04:00:15

6 sink down. It's literally dissolved in the water, 04:00:19

7 and it flows along with the water. 04:00:24

8 TCE, as we call DNAPL in its pure form, if 04:00:28

9 that's in an aquifer, that will move down not due to 04:00:34

10 groundwater as much as it is due to gravity because 04:00:37

11 it is heavier than water. 04:00:40

12 Q So based on that explanation, is it 04:00:42

13 plausible that some small percentage of TCE may be 04:00:44

14 migrating at the same rate as groundwater? 04:00:51

15 A Based on my analysis of the data, no. 04:00:55

16 Q Well, just based on your description of 04:01:02

17 TCE, all chemicals are moving along with the 04:01:06

18 groundwater? I'm asking this in a hypothetical 04:01:10

19 sense. 04:01:19

20 A No. 04:01:24

21 Q So you're saying that -- so, again, just to 04:01:25

22 be clear, you know, when we get to trial, is your 04:01:30

23 opinion that it is impossible for VOC particles to 04:01:37

24 move at the speed of groundwater -- dissolved VOC 04:01:43

25 particles to move at the speed of groundwater and 04:01:48

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1 impact the Saugus Formation wells? 04:01:51

2 A Well, I'll answer it this way. Based on 04:01:55

3 the data that I've reviewed, that did not occur at 04:02:01

4 this site. 04:02:04

5 Q Not -- let's scrub the data. Is it 04:02:05

6 theoretically possible? 04:02:10

7 MR. HAGSTROM: Calls for speculation. 04:02:11

8 THE WITNESS: Theoretically possible based 04:02:15

9 on what? I'm sorry. I'm missing your point. 04:02:18

10 BY MR. GEE: 04:02:20

11 Q All right. I'm trying to digest your 04:02:20

12 statement that -- that dissolved VOC particles can 04:02:24

13 move at the speed of groundwater. 04:02:32

14 A That was not my testimony, sir. My 04:02:36

15 testimony is that they move with the groundwater and 04:02:39

16 because of retardation, they move slower than 04:02:43

17 groundwater. 04:02:46

18 Q Okay. And because of retardation, the 04:02:47

19 retardation factors mean that it intersects some 04:02:51

20 sort of carbon compound in the -- in the aquifer. 04:02:55

21 Is that -- is that -- was that an accurate 04:03:04

22 reflection of your prior testimony, that retardation 04:03:13

23 is caused by VOCs intersecting with some sort of 04:03:16

24 carbon molecule in the aquifer? 04:03:21

25 A Yeah, the retardation of a chemical, in 04:03:24

1       this case we're talking about TCE, will vary       04:03:33  
2       depending on the aquifer properties and organic       04:03:36  
3       carbon is one of them.       04:03:42

4           Q       Okay. And is it theoretically possible       04:03:45  
5       that TCE can flow through groundwater without       04:03:53  
6       intercepting one of these carbon particles?       04:03:57

7           A       What I know is there's been a -- as you       04:04:02  
8       might imagine, there's been a tremendous amount of       04:04:05  
9       research in this particular issue.       04:04:09

10               It's a big issue in the contaminant       04:04:11  
11       hydrogeology field, and what all of that field study       04:04:14  
12       and research shows is that there is retardation of       04:04:17  
13       chlorinated compounds. How much varies depending on       04:04:24  
14       the aquifer properties.       04:04:27

15           Q       Other than another source of VOCs being the       04:04:40  
16       cause of higher concentrations of VOCs in the lower       04:04:44  
17       HSUs, have you considered any other theories as to       04:04:49  
18       why that might be?       04:04:52

19           A       Well, that seemed like the most likely one       04:04:53  
20       to me, sir. I looked at Bermite being a source. I       04:05:03  
21       looked at SIC being a source. I looked at the       04:05:08  
22       potential of other sources.       04:05:12

23               I don't believe there was enough data from       04:05:16  
24       the SIC site to say that they were a source of 201       04:05:18  
25       and 205. Based on my analysis, I concluded Bermite       04:05:22

1 was not the source of VOCs in 201 and 205. That 04:05:27  
2 left me with other sources in the vicinity of those 04:05:32  
3 two wells. 04:05:35  
4 Q And did you perform any kind of rate -- 04:05:38  
5 fate and trans- -- strike that. It's getting late. 04:05:41  
6 Did you consider any other fate and 04:05:45  
7 transport theories that might explain why VOCs are 04:05:48  
8 concentrating in the lower HSUs? 04:05:54  
9 A I want to ask, before we go on to the lower 04:05:58  
10 HSU, what -- what are you referring to there, sir, 04:06:01  
11 just so we're clear? 04:06:04  
12 Q I think your opinion referenced -- what was 04:06:06  
13 that, HSU-5, that concentrations were increasing or 04:06:09  
14 did I misstate the HSUs -- 04:06:16  
15 A That's why I wanted -- wanted to make sure 04:06:20  
16 that you and I are clear on the record. 04:06:21  
17 Q Which HSUs were you referring to in your 04:06:27  
18 opinion? 04:06:32  
19 A Well, if you look at -- well, let's -- why 04:06:32  
20 don't we just go to the expert report and see what I 04:06:36  
21 said. 04:06:40  
22 Q Okay. 04:06:40  
23 A Like you said, my memory is not perfect. I 04:06:43  
24 refer to -- I'd refer to some monitoring wells in 04:07:06  
25 the vicinity, and I wrote that three of the wells 04:07:14

1 are screened in the Saugus-3c formation and one well 04:07:16  
2 was screened in the Saugus-5 formation. 04:07:22  
3 Q Okay. All right. 04:07:26  
4 A I just wanted to be clear. So I'm sorry. 04:07:32  
5 What was your question, sir? 04:07:35  
6 Q Okay. Well, let me ask a question. Okay. 04:07:36  
7 So your opinion was -- is based on concentrations of 04:08:06  
8 VOCs being higher -- being deducted in higher -- I'm 04:08:10  
9 not -- I'm not -- I'm not having an easy time 04:08:18  
10 reading a sentence. 04:08:21  
11 I'm looking at opinion five, second 04:08:27  
12 paragraph, second sentence. "The concentrations of 04:08:32  
13 VOCs are higher than concentrations detected in 04:08:36  
14 upgradient monitoring wells." 04:08:40  
15 So is that -- is that throughout the -- 04:08:44  
16 throughout the -- is that throughout the -- okay. 04:08:46  
17 Let me ask the question. 04:08:59  
18 What -- what monitoring wells are you 04:09:00  
19 talking about when you're making this comparison? 04:09:01  
20 A When I looked at the monitoring wells, the 04:09:04  
21 ones we've talked about extensively on the western 04:09:09  
22 boundary of OU-4, which basically don't show VOCs, 04:09:11  
23 the SG series wells near Saugus-1 and also on the 04:09:16  
24 southern side of OU-4, the wells that we previously 04:09:24  
25 talked about. 04:09:27

1 Q Okay. So would your -- is your opinion 04:09:28  
2 based on the concentrations of VOCs detected at 04:09:33  
3 certain monitoring wells on the Whittaker-Bermite 04:09:45  
4 site have lower detection levels than at V-205 and 04:09:50  
5 V-201 as evidence that there was another source? 04:09:57

6 A No, it's -- when I used the data that I 04:10:03  
7 just mentioned was to conclude that the VOC 04:10:07  
8 detections in 201 and 205 were not from the Bermite 04:10:12  
9 site, and if they're not from the Bermite site, they 04:10:16  
10 must be from somewhere else. 04:10:20

11 Q Okay. And in that -- in your conclusion, 04:10:22  
12 did you consider the high levels of concentrations 04:10:28  
13 on the western side of OU-3 that appear to be at 04:10:31  
14 least in some models within the capture zone of 04:10:35  
15 V-201? 04:10:38

16 A I considered all of the data, sir. 04:10:41

17 Q Okay. And how did you eliminate the 04:10:45  
18 possibility that the high concentrations of VOCs 04:10:47  
19 detected in the western portion of OU-3 did not 04:10:51  
20 contribute to VOC contamination found in V-201? 04:10:59

21 A I think I already answered that, but I'll 04:11:04  
22 answer it again for you. 04:11:07

23 Part of my analysis was that if 04:11:10  
24 contaminants in the highest concentrations of the 04:11:14  
25 VOCs are in Saugus-3 and Saugus -- OU-3 and Saugus 04:11:17

1 OU-4, and if those VOCs have not migrated through 04:11:24  
2 the western boundary of OU-4 as water level data and 04:11:30  
3 perchlorate data would indicate, that that's the 04:11:36  
4 migration pathway. If they haven't gotten that far, 04:11:39  
5 they couldn't get to V-205. It's just way too far. 04:11:42

6 Q And -- and excuse me if I'm misreading your 04:11:49  
7 report, but I thought that the absence of VOCs in -- 04:11:54  
8 on the western side of OU-4 was evidence that the 04:12:00  
9 VOCs were not getting to Saugus-1 and Saugus-2. 04:12:05

10 Did -- does the absence of VOCs on the west 04:12:08  
11 side of OU-4 also -- is that also definitive 04:12:12  
12 evidence that VOCs are not migrating to V-201? 04:12:26

13 A Not migrating or haven't gotten there, 04:12:29  
14 those are two different things. 04:12:35

15 Q Okay. I haven't gotten to V-201. Is it 04:12:36  
16 dispositive that -- that the absence of VOCs on the 04:12:40  
17 west side of OU-4 dispositive evidence that VOCs 04:12:44  
18 cannot get to V-201? 04:12:50

19 A That was part of my analysis. That was a 04:12:54  
20 main part of it. I also looked at -- and I 04:12:56  
21 testified just a few minutes ago -- I also looked at 04:13:00  
22 water quality data in 201 and 205 itself and the 04:13:03  
23 first detection of perchlorate and VOCs. 04:13:10

24 The other thing I looked at is that the 04:13:16  
25 monitoring wells in the area show PCE impacts -- 04:13:19



1 detections. 201 and 205 don't. So I looked at all 04:13:26  
2 the water quality data to draw that conclusion. 04:13:32  
3 Q Mr. Hokkanen, you -- is it true that you 04:14:37  
4 used water quality data to determine a -- that there 04:14:41  
5 was a retardation of two for TCE? 04:14:45  
6 A I used the water quality data -- I think it 04:14:51  
7 was between two and two and a half, something like 04:14:54  
8 that. 04:15:02  
9 Q And you read Mr. Trudell's report. Did 04:15:02  
10 you -- did he also find that the retardation rate 04:15:04  
11 was probably about two, two and a half in his 04:15:07  
12 report? 04:15:10  
13 A He calculated a value for TCE based 04:15:10  
14 essentially on literature values of about two and a 04:15:15  
15 half. 04:15:19  
16 Q Okay. And those two numbers sound pretty 04:15:19  
17 close to me. 04:15:25  
18 Is there -- is there a reason that -- 04:15:25  
19 that -- to -- to suggest that maybe his literature 04:15:30  
20 is consistent with your observations and that 04:15:35  
21 perhaps a retardation factor of two to two and a 04:15:39  
22 half may be a realistic one? 04:15:43  
23 A Based on the water quality data, I think 04:15:44  
24 about two and a half is what the data shows. 04:15:48  
25 Q So does that suggest that his calculation 04:15:55

1 may not be that far off? 04:16:07

2 MR. HAGSTROM: Object -- objection. It's 04:16:10

3 vague and ambiguous as to -- I'm not sure what 04:16:15

4 calculation you're talking about. 04:16:17

5 BY MR. GEE: 04:16:19

6 Q Do you understand the question, 04:16:19

7 Mr. Hokkanen? We're talking about the retardation 04:16:21

8 factors. 04:16:24

9 A Yeah, he calculated a retardation factor, 04:16:24

10 and if you're asking me if his was -- the one he 04:16:27

11 calculated was close to what the data shows out at 04:16:32

12 the site, yeah, they're very close. 04:16:35

13 Q Okay. 04:16:35

14 A You know, was he -- was it an accurate way, 04:16:41

15 did he get lucky, you know, they're very close. 04:16:43

16 Q But you never calculated a retardation 04:16:49

17 factor yourself, you based -- based on theory -- 04:16:54

18 groundwater and hydrogeological factors that one 04:17:04

19 would use to calculate retardation factors? 04:17:08

20 A Well, I specifically chose not to and the 04:17:11

21 reason I specifically chose not to is that if you 04:17:16

22 have a tracer perchlorate, you can compare the 04:17:19

23 migration of that to the migration of other 04:17:24

24 chemicals and get a real-world retardation factor, 04:17:29

25 not a calculated one. So given the fact that I had 04:17:33

1 all this data, I chose to use -- to look at the 04:17:38  
2 retardation of TCE. 04:17:44

3 Q How many data points did you use to 04:17:48  
4 calculate the retardation factor? 04:17:50

5 A I used all of the data that's been 04:17:52  
6 generated for TCE and perchlorate. 04:17:55

7 Q And how many data points would that be? 04:18:00

8 A I think we said Bermite has what, over 200 04:18:03  
9 wells, and there are a number of wells off-site. So 04:18:07  
10 all of the wells that are out at the site were used. 04:18:11

11 Q Okay. So you looked at data from 200 -- I 04:18:16  
12 think we said there's less than 25 off-site wells or 04:18:20  
13 thereabouts, so you evaluated data from all 225 04:18:24  
14 monitoring wells to -- to establish your retardation 04:18:31  
15 factor? 04:18:35

16 A I think I just testified that I used the 04:18:38  
17 data from all of the wells, and what that data shows 04:18:41  
18 you is where the perchlorate -- perchlorate has 04:18:44  
19 impacted groundwater and where TCE has impacted 04:18:46  
20 groundwater. 04:18:52

21 Q Now, Mr. Hokkanen, I'm by no means a 04:18:58  
22 hydrogeologist, but how did you determine what TCE 04:19:02  
23 migrated from monitoring well A to monitoring well 04:19:09  
24 B? I mean isn't TCE, TCE and is there a way to tell 04:19:14  
25 whether there's -- that the TCE that migrated from 04:19:20

1 monitoring well A to monitoring well B is the same 04:19:22

2 TCE? 04:19:28

3 A Well, we -- our industry has developed 04:19:36

4 forensic techniques to do that. I don't believe any 04:19:38

5 of that has been done at this site. 04:19:41

6 Q Okay. So, again, I'm not a hydrogeologist. 04:19:47

7 I'm just trying -- trying to visualize how you would 04:19:50

8 go about making some sort of flow calculation if 04:19:56

9 there are multiple source locations and 200 04:20:04

10 something monitoring wells as to which source you 04:20:08

11 assume, just moving from one area to another area, 04:20:14

12 and how you actually measure the -- the flow rate of 04:20:18

13 a contaminant that's fairly ubiquitous? 04:20:27

14 MR. HAGSTROM: Objection; compound. 04:20:30

15 Sorry. 04:20:33

16 THE REPORTER: What was your question? 04:20:34

17 BY MR. GEE:

18 Q Is there a simple way to do that? 04:20:36

19 A Well, let -- we started out this morning 04:20:42

20 talking about the first three opinions that I have 04:20:50

21 in my expert report, and interestingly enough, your 04:20:52

22 two experts agree with my first three opinions; that 04:20:58

23 generally speaking the sources are colocated and 04:21:01

24 that dissolved perchlorate and the VOCs migrate in 04:21:06

25 groundwater along the same flow path and, three, 04:21:11

1       that it moves essentially at the rate of groundwater       04:21:17  
2       and VOCs move slower than that.       04:21:23  
3               Dr. Trudell, as you've said, estimated       04:21:27  
4       about two and a half. Ms. Stanin was somewhere       04:21:28  
5       around two or so, and so using that information, I       04:21:32  
6       used the perchlorate data, as Ms. Stanin said, as a       04:21:37  
7       tracer.       04:21:43  
8               Very few sites that I've worked on have a       04:21:45  
9       tracer like that to be able to actually measure with       04:21:48  
10       water level -- water quality data the retardation of       04:21:52  
11       other chemicals. And I used that data very simply       04:21:58  
12       how far perchlorate migrated, how far TCE migrated,       04:22:02  
13       that directly gives you the retardation rate of TCE.       04:22:06  
14       Q       Okay. Mr. Hokkanen, did you do any type of       04:22:11  
15       sensitivity analysis to determine, for instance,       04:22:26  
16       what the impact of your assumption regarding       04:22:29  
17       distance perchlorate traveled has on your analysis?       04:22:36  
18       For example, let's say that there was an unknown       04:22:41  
19       equivalent to a groundwater jet stream that changes       04:22:49  
20       the direction of perchlorate contamination and that,       04:22:53  
21       you know, like if you drilled a monitoring well, you       04:22:59  
22       know, five miles off-site, you know, like you -- you       04:23:03  
23       find a surprise detection of perchlorate.       04:23:07  
24               Have you done a sensitivity analysis as to       04:23:11  
25       what -- as to what parameters that are not       04:23:16

1 particularly known have on your analysis? 04:23:21

2 MR. HAGSTROM: Objection. It's compound. 04:23:24

3 It's also ambiguous. 04:23:25

4 THE WITNESS: I think I can answer that 04:23:31

5 this way. A sensitivity analysis is typically 04:23:33

6 performed or can be performed when you do a modeling 04:23:38

7 study. 04:23:41

8 And the reason you do a sensitivity 04:23:41

9 analysis is that -- is that the data that you're 04:23:44

10 using to model, whether it's flow or contaminant 04:23:49

11 transport, is subject to uncertainty. 04:23:51

12 And that's why you do a sensitivity 04:23:53

13 analysis. You vary parameters. You see what the 04:23:56

14 effect is. What I'm simply doing is using actual 04:23:58

15 water quality data elected from the monitoring 04:24:05

16 wells, looking at how far perchlorate has migrated 04:24:09

17 and how far TCE has migrated and then coming up with 04:24:13

18 a retardation factor. 04:24:16

19 Q Going back to the hypothetical, if the 04:24:19

20 perchlorate plume was twice as long, would your 04:24:29

21 retardation factor be one-half of what you 04:24:32

22 calculated? 04:24:35

23 A If it was twice as long, the retardation 04:24:35

24 factor would be twice as big, because if perchlorate 04:24:41

25 went further out, that means TCE is moving that much 04:24:44

1 slower. So instead of two and a half or so, it 04:24:50  
2 would be five. 04:24:53  
3 Q Five, okay. Understood. Even defense 04:24:53  
4 attorneys sometimes can do multiplication. 04:24:59  
5 A Well, I'm not an attorney either so -- 04:25:01  
6 Q Now, if the retardation factor were one or 04:25:04  
7 two, would that suggest -- 04:25:29  
8 A Can you repeat that? I was closing a 04:25:30  
9 window because there was noise outside. 04:25:32  
10 Q Go close the window, and I'll ask the 04:25:33  
11 question after you closed it. 04:25:36  
12 Did you close the window? 04:25:39  
13 A I'm done. I did it. Thank you. 04:25:40  
14 Q All right. So based on that analysis, if 04:25:41  
15 the retardation factor were one instead of two, then 04:25:45  
16 TCE would travel faster than what you have projected 04:25:52  
17 with that retardation -- 04:26:01  
18 A Somehow you -- somehow you could show it 04:26:03  
19 was one, yes. What a retardation factor of one 04:26:05  
20 means, which is basically what perchlorate is, it 04:26:11  
21 moves at the same rate as groundwater. 04:26:13  
22 Q Oh, okay. All right. So the difference 04:26:16  
23 between two and one doesn't sound like a big number, 04:26:20  
24 but in this analysis, the difference between two and 04:26:23  
25 one is -- is quite significant? 04:26:26

1           A     Well, for example, let me -- let me just           04:26:32  
2           explain how you used retardation factor. If           04:26:35  
3           ground -- if you can calculate groundwater over a       04:26:38  
4           period of time moves a thousand feet, you divide by    04:26:42  
5           the retardation factor for a specific chemical to       04:26:46  
6           determine how far it moved.                           04:26:51

7                     So if it moves -- if groundwater moves a       04:26:53  
8           thousand feet, the retardation factor is two. A       04:26:55  
9           thousand divided by two is 500.                       04:27:04

10          Q     And, Mr. Hokkanen, your retardation factor       04:27:05  
11          was based on the monitoring wells on-site because       04:27:24  
12          it's your opinion that none of TCE moved off-site.       04:27:29

13                     Is that a correct assumption?               04:27:33

14          A     I'm sorry. Could you repeat that question?       04:27:34

15          Q     Okay. Your retardation factor is that           04:27:37  
16          based on on-site groundwater monitoring data because    04:27:41  
17          it's your opinion that TCE has not migrated            04:27:48  
18          off-site?   04:27:51

19          A     No, it's not connected to that. What --        04:27:52  
20          the reason I use on-site is to -- is to determine       04:27:57  
21          the length of travel of the perchlorate plume and       04:28:02  
22          the TCE plume.   04:28:06

23          Q     Okay. And you didn't use any off-site           04:28:11  
24          monitoring wells to make that determination?           04:28:15

25          A     Which determination?                            04:28:17



1 Q The TCE migration rate. 04:28:20

2 A Well, I didn't need to because my opinion 04:28:25

3 is it hasn't moved off-site. It hasn't moved past 04:28:28

4 the western boundary of OU-4. 04:28:32

5 If you look at the water quality data and 04:28:35

6 we've talked about the AECOM work that's been done 04:28:38

7 in their quarterly monitoring reports, that data 04:28:41

8 shows that the TCE plumes haven't moved off the 04:28:50

9 western boundary of OU-4. 04:28:54

10 Q Okay. If, let's say, for instance, 04:28:55

11 somebody did do a tracking study and it showed that 04:29:00

12 the TCE and Saugus-1 and Saugus-2 were from the 04:29:04

13 Whittaker-Bermite site, what would that retardation 04:29:09

14 factor be at that point? 04:29:12

15 MR. HAGSTROM: Calls for speculation. 04:29:14

16 Go ahead. 04:29:15

17 THE WITNESS: I'm sorry. That was -- I 04:29:18

18 want to understand the question. 04:29:22

19 BY MR. GEE: 04:29:24

20 Q Okay. I'm posing a hypothetical. Suppose 04:29:24

21 that you ran a TCE isotope test and it demonstrated 04:29:29

22 that TCE found in Saugus-1 and Saugus-2 was from the 04:29:32

23 Whittaker-Bermite site. 04:29:38

24 How would that impact the TCE retardation 04:29:40

25 factor calculation? 04:29:43

1 MR. HAGSTROM: Object. It presupposes an 04:29:47  
2 answer. 04:29:50  
3 THE WITNESS: I mean in a general -- 04:29:50  
4 despite your hypothetical, in a general sense, if 04:29:54  
5 TCE migrated further than the data currently shows, 04:29:57  
6 then it would reduce the retardation factor. 04:30:00  
7 BY MR. GEE: 04:30:04  
8 Q Okay. And from -- if we assume -- and I 04:30:04  
9 guess this would be a distance calculation then at 04:30:10  
10 that point -- if we assume that the -- the TCE found 04:30:13  
11 in Saugus-1 and Saugus-2 came from the 04:30:22  
12 Whittaker-Bermite site, would the retardation factor 04:30:25  
13 be on the order of one and a half, 1.1, 1.8 -- 04:30:27  
14 MR. HAGSTROM: Hang on. Object as 04:30:33  
15 compound. It also presupposes an answer. 04:30:36  
16 Go ahead, Mr. Hokkanen. 04:30:40  
17 THE WITNESS: I haven't -- I haven't looked 04:30:42  
18 at that. It would be pretty easy to look at. I 04:30:43  
19 don't know.  
20 BY MR. GEE: 04:30:46  
21 Q Okay. 04:30:46  
22 A But you could -- you could calculate that, 04:30:47  
23 yes. 04:30:50  
24 Q Okay. Okay. What I'm going to do is, you 04:30:50  
25 know, your opinion number six deals with the SIC 04:31:14

1 site, and, you know, I have some 04:31:17  
2 hydrogeological-type questions associated to your 04:31:23  
3 opinion, and Mr. Sinclair has some other questions 04:31:24  
4 about your opinion six. 04:31:28

5 So I'm going to start with your opinion 04:31:29  
6 six, and then I'm going to turn the reins over to 04:31:31  
7 Mr. Sinclair to ask some questions, and then I'll 04:31:34  
8 regroup my thoughts, eat a granola bar, and then 04:31:38  
9 move on to your opinions number eight and nine. 04:31:43

10 A Excuse me. If we're going to switch gears, 04:31:51  
11 could we take like five minutes tops? 04:31:53

12 Q Mr. Hokkanen, I said any time you want to 04:31:57  
13 take a break, just ask. 04:32:01

14 A This is the time. 04:32:02

15 MR. GEE: Okay. Let's go off the record. 04:32:04

16 THE VIDEOGRAPHER: We're going off the 04:32:06  
17 record at 4:31. 04:32:07

18 (Recess taken.) 04:43:49

19 THE VIDEOGRAPHER: We are now back on the 04:43:50  
20 record. The time is 4:44. Please proceed. 04:44:24

21 BY MR. GEE:

22 Q Mr. Hokkanen, just to clean up on your 04:44:28  
23 opinion number five, you mentioned that you relied 04:44:32  
24 on groundwater monitoring well data, and I just want 04:44:39  
25 to make sure for trial, I don't get surprised. 04:44:45

1           The off-site groundwater monitoring data,           04:44:48  
2           do you have a list of the wells that you considered       04:44:52  
3           or maybe can you tell me on the record which ones       04:44:57  
4           you -- which off-site groundwater monitoring wells       04:45:00  
5           you considered?           04:45:03

6           A       I think I can do that. I think as I           04:45:08  
7           testified, I considered on-site wells and off-site       04:45:12  
8           wells.           04:45:15

9           There are a series of wells, as I           04:45:15  
10          testified, in and around V-201 and V-205 --       04:45:20

11          THE REPORTER: I'm sorry, sir. I'm sorry.  
12          You said V-201 and then you froze a little bit.

13          THE WITNESS: And V-205. The other  
14          off-site wells, I think I already mentioned. There  
15          are the SG1-HSU well nest. There is the CW-01 well  
16          nest, the OS-MW-01 well nest, and then the wells  
17          near NC-13. I can't remember their exact names  
18          right now.

19          BY MR. GEE:           04:45:32

20          Q       Okay. And the well clusters by V-201 and       04:45:32  
21          V-205, do they include the mall well and the library   04:45:33  
22          well?

23          A       There's the MP wells that are north of 201       04:46:22  
24          and 205, DW-1 and DW-2. I looked at all of the data   04:46:25  
25          from all those monitoring wells.           04:46:32

1 Q Okay. And, of course, I take it that you 04:46:34  
2 considered the production wells -- the information 04:46:37  
3 from the production wells as being something like a 04:46:41  
4 monitoring well? 04:46:45

5 A Well, I looked at the data from -- from the 04:46:46  
6 production wells, not as a monitoring well, but I 04:46:51  
7 looked at -- for example, I specifically looked at 04:46:57  
8 arrival times of perchlorate and VOCs, particularly 04:47:00  
9 TCE has been detected in those two wells. 04:47:03

10 Q Okay. Let's go to your opinion number six, 04:47:09  
11 and I have written here that "VOCs have contaminated 04:47:15  
12 groundwater at the SIC Site and there is a plausible 04:47:21  
13 pathway for groundwater from the SIC Site to migrate 04:47:27  
14 to the Water Agency groundwater production wells due 04:47:31  
15 to the unique geology of the SIC site and its 04:47:38  
16 proximity to the groundwater production wells." 04:47:46

17 Did I read that correctly, Mr. Hokkanen? 04:47:48

18 A I think you got that right, sir. 04:47:50

19 Q Okay. Now, when you used "plausible 04:47:53  
20 pathway," are you using it in a way that we earlier 04:48:00  
21 discussed? And you have to refresh my memory as to 04:48:04  
22 what you considered a plausible pathway to mean from 04:48:09  
23 a hydrogeological standpoint. 04:48:12

24 A I examined -- as I describe in my expert 04:48:15  
25 report, I examined geologic data, hydrogeologic 04:48:19

1 data, chemical data, and concluded that there was a 04:48:26  
2 plausible pathway for groundwater to migrate from 04:48:30  
3 the SIC to the Saugus production wells. 04:48:35

4 Q Okay. And earlier when you said 04:48:39  
5 "plausible," does that mean -- did that mean 04:48:42  
6 theoretical based on modeling and an incomplete set 04:48:46  
7 of data or did you make a distinction between 04:48:55  
8 possible pathway and -- and -- 04:49:02

9 A Hypothetical. 04:49:07

10 Q No, that's -- yeah, I mean -- yeah, and 04:49:08  
11 hypothetical. 04:49:12

12 Are we dealing with -- with the 04:49:15  
13 hypothetical pathway here or are we dealing with an 04:49:18  
14 actual plausible pathway? 04:49:23

15 A Yeah, I -- if you read my opinion into the 04:49:29  
16 record, I examined, as I testified to just a minute 04:49:33  
17 ago, information related to this subject, and I 04:49:38  
18 concluded that there was a plausible pathway. 04:49:42

19 I couldn't conclude that there was an 04:49:47  
20 actual pathway, but there was enough information to 04:49:49  
21 conclude that there was a plausible pathway, and 04:49:54  
22 that's my opinion six. 04:49:56

23 Q Okay. And what additional data would you 04:49:58  
24 have required to show that there would be an actual 04:50:03  
25 pathway? 04:50:05

1           A       It is the same as what I've talked about       04:50:12  
2       quite a bit what I examined at the Whittaker site,       04:50:14  
3       which is water level data and water quality data,       04:50:17  
4       and as I discussed in my expert report, on the       04:50:21  
5       lateral and vertical extent of VOC impact at the SIC       04:50:26  
6       site hasn't been determined at this point, and       04:50:32  
7       contaminants, particularly TCE and chloroform, have       04:50:38  
8       migrated off-site.       04:50:43

9           The extent of that migration, for example,       04:50:45  
10       hasn't been characterized. In addition, and more       04:50:48  
11       importantly, the vertical extent of contamination       04:50:52  
12       hasn't been identified and also the vertical flow       04:50:55  
13       paths from the SIC site have not been characterized.       04:51:02

14          Q       I was trying to figure out some of your       04:51:13  
15       references. On page 72 of your report, let me see       04:51:18  
16       if I can get a PDF page for Mr. Hagstrom. That       04:51:25  
17       would be PDF page -- actually that is PDF page 72       04:52:10  
18       which, since it's an appendix, I guess, it doesn't       04:52:15  
19       have its own dedicated page number. So it's on PDF       04:52:19  
20       page 72.       04:52:23

21          A       Okay.       04:52:27

22          Q       Starting with the third entry on page 72       04:52:28  
23       and going down to the next page -- bottom of the       04:52:31  
24       next page, you indicated that you listed several       04:52:35  
25       AECOM documents that -- on the SIC site; is that       04:52:40

1 correct? 04:52:45

2 A What's on those two pages, yes. 04:52:46

3 Q Now, I went to the EnviroStor website, and 04:52:50

4 I couldn't find an AECOM report generated for the 04:52:54

5 SIC site. 04:52:58

6 Where did you get -- where did you get 04:53:02

7 these reports from? 04:53:03

8 A EnviroStor. 04:53:06

9 Q Okay. So AECOM did -- did perform some 04:53:09

10 studies at the Saugus Industrial Center? 04:53:19

11 A They did quite a bit of work as you can see 04:53:22

12 out there. 04:53:28

13 Q Okay. I'll have to take another look. 04:53:28

14 MR. SINCLAIR: If I could just interject, I 04:53:32

15 think you may have meant Apex. Maybe that's a typo, 04:53:35

16 A-p-e-x. 04:53:47

17 THE WITNESS: They actually did other 04:53:47

18 reports. AECOM actually did a bunch of work out 04:53:49

19 there, and that list of Apex reports below that. 04:53:52

20 They start on the next page. 04:53:56

21 MR. SINCLAIR: I think you -- well -- 04:54:00

22 MR. GEE: I'll take another look at it. I 04:54:02

23 just couldn't find any AECOM reports on the SIC 04:54:06

24 site. 04:54:10

25 THE WITNESS: If it's a typo, I apologize. 04:54:10

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1 I don't believe it is, but -- 04:54:13

2 BY MR. GEE: 04:54:15

3 Q Okay. Is that under -- no, it wouldn't be 04:54:15

4 under Keysor-Century because Keysor-Century doesn't 04:54:21

5 have a separate site. 04:54:24

6 Okay. Well -- 04:54:31

7 MR. HAGSTROM: If it's a typo, we'll fix 04:54:32

8 it, Byron. 04:54:35

9 BY MR. GEE: 04:54:51

10 Q Okay. We've already discussed the 04:54:51

11 definition of plausible pathway, and I guess you had 04:54:55

12 described the information that you would need to 04:55:03

13 determine whether it's a natural pathway. 04:55:06

14 In your expert report, you indicate that 04:55:13

15 the San Gabriel fault is to the north of the SIC 04:55:15

16 site; is that correct? 04:55:21

17 A My understanding, yes. 04:55:21

18 Q Doesn't the Whittaker-Bermite actually lie 04:55:23

19 on this -- on the San Gabriel fault? 04:55:28

20 A It runs through part of the Bermite site, 04:55:32

21 correct. 04:55:36

22 Q Okay. Are there any areas in the 04:55:38

23 Whittaker-Bermite site that have this sharp 04:55:41

24 60-degree slope in the Saugus Formation that you 04:55:46

25 describe at the SIC site? 04:55:51

1           A     I really haven't looked at that. I was 04:55:53  
2           focusing on the SIC site. There's information out 04:55:57  
3           there. You could probably look at that. 04:56:03  
4           Q     Okay. Would they be in the AECOM reports? 04:56:05  
5           A     I found most of the information -- well, I 04:56:14  
6           have two references in the text. One is a geologic 04:56:18  
7           map by Dibblee, sort of the go-to structural map in 04:56:23  
8           the area, and then for the SIC site, there was a 04:56:29  
9           report done by RAMCO that looked at and discussed 04:56:33  
10          what the geology was at the site. 04:56:37  
11          Q     Okay. Now, you say that there's a 04:56:43  
12          60-degree slope. 04:56:50  
13                Is that 60 degrees from vertical or 04:56:51  
14          horizontal? 04:56:55  
15          A     It's -- it's past 45. It's 60 degrees from 04:56:56  
16          horizontal. 04:57:05  
17          Q     That's a pretty significant slope, isn't 04:57:06  
18          it? 04:57:10  
19          A     That's what I thought, sir. 04:57:11  
20          Q     Okay. Now, with that dramatic a slope, 04:57:12  
21          wouldn't you expect to see any impacts on the fault 04:57:22  
22          at the surface of the SIC site, meaning that, you 04:57:27  
23          know, if a fault made that big of an impression on a 04:57:31  
24          subsurface aquifer -- a shallow subsurface aquifer, 04:57:35  
25          wouldn't you expect to see some indication that the 04:57:43

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1 fault would have impacted the surface of the SIC 04:57:45  
2 site? 04:57:50  
3 A Well, the immediate surface of the SIC site 04:57:50  
4 are alluvial materials, and so that's -- alluvial 04:57:54  
5 materials aren't faulted. It's the Saugus Formation 04:58:01  
6 below it. There is an expression -- well, let me go 04:58:05  
7 back. 04:58:08  
8 Again, RAMCO did a geologic survey of the 04:58:08  
9 site -- the SIC site and identified out-croppings of 04:58:12  
10 the fault in the foothills to the north and east of 04:58:17  
11 the main flat part of the property. So there are 04:58:21  
12 expressions of the fault, but not in the alluvial 04:58:26  
13 materials. 04:58:30  
14 Q Okay. And what direction was that from the 04:58:30  
15 SIC site where they saw those -- those depressions? 04:58:35  
16 A Well, I'd have to go back and reread. It's 04:58:39  
17 called the modified geology report by RAMCO, but 04:58:45  
18 they identified the dipping beds. Dibblee 04:58:48  
19 particularly identified the Saugus -- or excuse 04:58:58  
20 me -- the Holser fault adjacent primarily east, 04:59:00  
21 there's expressions of the fault east of the site. 04:59:04  
22 Most of the part of the SIC site that was 04:59:08  
23 used has buildings on it, those are alluvial 04:59:14  
24 materials. There's not a surface expression of the 04:59:18  
25 fault. It's below the alluvial materials. 04:59:22

1 Q Okay. But even with alluvial materials, I 04:59:25  
2 mean we're talking about a pretty significant 04:59:29  
3 depression, and I understand different media will -- 04:59:31  
4 different media will have a tendency to move 04:59:38  
5 differently, but 60 degrees, I don't think I've ever 04:59:40  
6 heard of anything quite that dramatic. 04:59:44

7 What -- what was the date of the Dibblee 04:59:47  
8 report? 04:59:50

9 A The date? 04:59:50

10 Q Yes. 04:59:53

11 A From memory, I can't remember. I have it 04:59:54  
12 in my -- '96. 05:00:02

13 Q 1996. 05:00:03

14 A And, again, it's a -- essentially a 05:00:04  
15 geologic map and it contains years of information 05:00:08  
16 collected in a pretty wide area, including Bermite, 05:00:12  
17 the SIC site, and areas where all the production 05:00:19  
18 wells are. 05:00:23

19 Q Okay. So how would you characterize the 05:00:23  
20 Dibblee document? Just a series of maps or is that 05:00:31  
21 an ordinary report or -- I guess I've never seen the 05:00:35  
22 report before. 05:00:40

23 A It's primarily a geologic map, and it's 05:00:41  
24 based on, again, a tremendous amount of fieldwork to 05:00:45  
25 develop a map like that over a number of years. I 05:00:50

1 don't know how many years, and it's -- it is the map 05:00:53  
2 that you go to understand the structural geology in 05:00:57  
3 that particular area. 05:01:01  
4 There have been studies before that. 05:01:04  
5 There's older studies that, you know, it's 05:01:06  
6 accumulation of knowledge over a long period of 05:01:09  
7 time. 05:01:14  
8 Q Okay. Was there any explanation in the 05:01:14  
9 report as to what causes this geological 05:01:18  
10 characteristic? 05:01:28  
11 THE REPORTER: Earl, can you mute, please? 05:01:28  
12 Thank you. 05:01:30  
13 THE WITNESS: I don't think she heard you, 05:01:38  
14 Mr. Gee. 05:01:39  
15 BY MR. GEE: 05:01:40  
16 Q Oh, okay. Was there any kind of write-up 05:01:40  
17 or explanation as to what caused this geological 05:01:42  
18 anomaly, if you will? 05:01:52  
19 A Simply, the -- we talked about -- earlier 05:01:55  
20 talked about the San Gabriel fault. San Gabriel 05:02:00  
21 fault is a fairly major fault in the area, and it 05:02:03  
22 has created what is called the fault zone on either 05:02:08  
23 side of the fault. 05:02:12  
24 So it's disrupted the sediments that have 05:02:13  
25 been laid down in the geologic path, and it's 05:02:16

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1 basically on the south side of the San Gabriel 05:02:20  
2 fault. It has folded the Saugus Formation that used 05:02:24  
3 to be horizontal, it's folded it up at a 60-degree 05:02:28  
4 angle. 05:02:33  
5 Q Okay. But that's the San Gabriel fault, is 05:02:33  
6 that right, or are you talking about the Holser 05:02:37  
7 fault? 05:02:40  
8 A It's a -- it's a part of the fault zone and 05:02:41  
9 in the fault zone, the formerly horizontal beds of 05:02:46  
10 the Saugus Formation have been disrupted quite a 05:02:51  
11 bit. They've been essentially folded upward due to 05:02:54  
12 the faulty action. 05:02:59  
13 Q And that occurred at the Saugus Industrial 05:03:00  
14 Center site or in closer proximity to the Saugus 05:03:04  
15 Industrial Site? 05:03:08  
16 A Well, the fault zone extends, again, as I 05:03:11  
17 said, north and south of the San Gabriel fault, and 05:03:14  
18 based on the Dibblee map and the information 05:03:17  
19 contained in there, there is the same beds right at 05:03:20  
20 the SIC site at about a 60-degree angle. 05:03:27  
21 Q Okay. And is the Holser fault an active 05:03:30  
22 fault; do you know? 05:03:36  
23 A I don't believe it's currently active. 05:03:36  
24 Q Okay. Now, would you agree, Mr. Hokkanen, 05:03:41  
25 that you can have a 60-degree slope and the impact 05:03:51

1 of that 60-degree slope, wouldn't that depend on how 05:04:03  
2 long of a length of 60-degree slope we have? 05:04:08  
3 For example, if I had a 60-degree slope 05:04:11  
4 that was only two inches long, would that have the 05:04:13  
5 same impact as a 60-degree slope that's 200 yards 05:04:16  
6 long? 05:04:21  
7 A Well, I can comment on your hypothetical. 05:04:24  
8 The answer at the SIC site is the regional -- the 05:04:28  
9 regional -- the Saugus Formation regionally dips to 05:04:35  
10 the -- essentially to the west at about a 10 to 15, 05:04:40  
11 depends on what part of the area you're in, a 10- to 05:04:46  
12 15-degree slope. 05:04:50  
13 And it so happens, as I described in the 05:04:52  
14 fault zone, due to the faulting, those beds have 05:04:56  
15 dipped -- they've been folded upwards and they dip 05:05:02  
16 at about a 60-degree angle. 05:05:05  
17 So as you move away from that 60-degree 05:05:08  
18 angle, it then transitions down into a 10- to 05:05:12  
19 15-degree angle at the regional bed's dip. Now, as 05:05:15  
20 I describe in my expert report, no one has mapped 05:05:20  
21 how that transition happens. 05:05:24  
22 You can make some geologic guesses based on 05:05:27  
23 mapping that's been done for the San Gabriel fault, 05:05:31  
24 but on the Dibblee map, it shows the transition from 05:05:37  
25 the dipping beds to the regional, but exactly how it 05:05:42

1 happens in this area, it hasn't been mapped. 05:05:46

2 Q Now, as I recall looking at the map of the 05:05:51

3 SIC site, it appears that the SIC site is relatively 05:05:53

4 flat compared to the Whittaker-Bermite site. 05:05:58

5 Is that an inaccurate characterization? 05:06:02

6 A Well, the part that's been used for 05:06:06

7 production over the years is flat. It's located in 05:06:09

8 the alluvial deposits and alluvial deposits in this 05:06:12

9 area are pretty flat. As you move to the east and 05:06:17

10 the north, you get up in the foothills in elevation. 05:06:21

11 MR. GEE: Okay. Can -- can I -- Linda, can 05:06:26

12 you read back the answer. There was enough pausing 05:06:32

13 and -- it's not you, Mr. Hokkanen. I think it's -- 05:06:36

14 it's the video. 05:06:40

15 THE REPORTER: No, I'm pretty sure it's his

16 bandwidth.

17 (The record was read as follows:

18 "A Well, the part that's been

19 used for production over the years

20 is flat. It's located in the

21 alluvial deposits and alluvial

22 deposits in this area are pretty

23 flat. As you move to the east and

24 the north, you get up in the

25 foothills in elevation.")



1 BY MR. GEE: 05:07:15

2 Q Okay. Now, when you talk about foothills 05:07:15

3 and elevation, are you talking about the SIC site 05:07:26

4 itself or are you talking about areas adjacent to 05:07:29

5 the SIC site? 05:07:34

6 A Well, the SIC site, if you look on some of 05:07:35

7 the maps, it's a pretty big area. Not all of it has 05:07:38

8 been used for production. There's some of that area 05:07:42

9 that has some elevation to it. 05:07:46

10 Q Okay. And the area that had the 05:07:48

11 contamination, is it in the elevated area or is it 05:07:54

12 in the flatter area of the SIC site? 05:07:57

13 A Well, the area that's been sampled is in 05:08:01

14 the flat area. What's potentially underneath the 05:08:05

15 other part of the site has not been investigated. 05:08:09

16 Q Mr. Hokkanen, what would you do to 05:08:13

17 characterize this 60-degree slope to figure out the 05:08:22

18 extent of the slope and how far it runs? Is there a 05:08:24

19 test that you can do to determine how long that 05:08:30

20 section is? 05:08:33

21 A The first thing I would probably do would 05:08:38

22 be to do a series of soil borings, try to 05:08:41

23 characterize where the different beds are as you 05:08:44

24 move away. Essentially the dipping is to the 05:08:49

25 southwest. 05:08:53

1                   If you did a series of borings, you may be                   05:08:53  
2                   able to determine how that transition from 60 to the                   05:08:56  
3                   regional 10 to 15 happened.                   05:09:00  
4                   Q       Okay. And didn't they drill a series of                   05:09:05  
5                   monitoring wells at the site?                   05:09:08  
6                   A       Yes, the deepest well was 180 feet.                   05:09:09  
7                   Q       Okay. And I don't know exactly what was                   05:09:15  
8                   done at the site, but I'm used to having whoever --                   05:09:20  
9                   the well drillers -- the monitoring well drillers do                   05:09:29  
10                  some soil characterization as they drill -- drill                   05:09:32  
11                  the monitoring well.                   05:09:39  
12                  Do you know if that was done in this -- in                   05:09:40  
13                  this area?                   05:09:42  
14                  A       Well, there are well logs for all the wells                   05:09:43  
15                  that were drilled at the SIC site, that's correct.                   05:09:48  
16                  Q       Okay. And could you tell from the well                   05:09:50  
17                  logs as to where the 60-degree slope was?                   05:09:53  
18                  A       That was actually done -- I did look at the                   05:09:58  
19                  well logs, and it's not done by the well driller in                   05:10:03  
20                  this case. It's done usually by geologists from the                   05:10:05  
21                  consulting firm. Water wells usually are done by                   05:10:08  
22                  well drillers, but these are monitoring wells.                   05:10:13  
23                  Q       Okay.                   05:10:18  
24                  A       And RAMCO, again, I refer to a report.                   05:10:19  
25                  It's called the modified geology report. RAMCO is                   05:10:22

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1 SIC's consultant. They did interpretations of those 05:10:27  
2 well logs to determine and verify the 60-degree 05:10:31  
3 slope. 05:10:36

4 Q And, you know, like in proximity to the 05:10:36  
5 manufacturing section of that 60 -- of the SIC site 05:10:40  
6 and not having read the report, but evidently, you 05:10:45  
7 did, whereabouts did they find that 60-degree slope 05:10:48  
8 relative to the manufacturing section of -- of the 05:10:52  
9 SIC site? What direction and how far away? 05:11:00

10 A Basically, it's right underneath the 05:11:03  
11 manufacturing area based on the Dibblee map. 05:11:06

12 Q Okay. But what about the RAMCO report, you 05:11:09  
13 know, the RAMCO analysis, based on their -- the 05:11:12  
14 monitoring well drilling samples, did they -- did 05:11:19  
15 they have -- did they reach a conclusion as to where 05:11:24  
16 that 60-degree anomaly was? 05:11:27

17 A Well, it's basically under -- under that 05:11:35  
18 whole area. It's not just a little spot. The 05:11:37  
19 Saugus Formation beds were uplifted in that area, 05:11:42  
20 and it's underneath, you know, sort of that -- that 05:11:46  
21 whole site. 05:11:50

22 It's exactly where the boundaries are, you 05:11:53  
23 know, you have to interpret the Dibblee map, but 05:11:55  
24 based on the geologic information, it's essentially 05:11:58  
25 under the manufacturing area. 05:12:02

1 Q Okay. So it's your opinion that the entire 05:12:04  
2 Saugus Formation beneath the manufacturing area at 05:12:12  
3 the SIC site is sloped at 60 degrees? 05:12:17  
4 A Based on the Dibblee map and the RAMCO 05:12:20  
5 report, that was -- that was my conclusion, yes. 05:12:28  
6 Q Okay. And how long is the manufacturing 05:12:31  
7 area at the SIC site? 05:12:38  
8 MR. HAGSTROM: Object; vague. 05:12:44  
9 THE WITNESS: Yeah, I haven't -- I haven't 05:12:47  
10 measured that. I'm not -- we can look at a map, if 05:12:49  
11 you'd like, Mr. Gee. 05:12:52  
12 BY MR. GEE: 05:12:53  
13 Q Yes, why don't we look at a map. I'm just 05:12:53  
14 curious, the 60-degree slope over like a 05:12:56  
15 manufacturing facility sounds like it can be a 05:13:03  
16 pretty long slope. 05:13:05  
17 So do you have -- do you have an estimate 05:13:08  
18 of the slope -- 05:13:12  
19 A Well, let's -- you want to look at the 05:13:12  
20 Dibblee map or do you want to look at an SIC map? 05:13:16  
21 Q Whichever one will give us the best 05:13:20  
22 estimate. 05:13:22  
23 A Of the size of the SIC site, is that the 05:13:23  
24 question? 05:13:28  
25 Q Well, you said that the 60-degree slope 05:13:28

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1 goes the entire length of the manufacturing part of 05:13:32  
2 the site. I just want to know how long the 05:13:37  
3 manufacturing part of the site is to get an 05:13:40  
4 appreciation as to how long the 60-degree slope, you 05:13:44  
5 know, transcends. 05:13:50  
6 MR. HAGSTROM: Object to the form of the 05:13:51  
7 question. 05:13:52  
8 MR. GEE: Mr. Hagstrom, I don't understand 05:13:58  
9 the objection. Maybe you could explain that to me 05:14:01  
10 someday. 05:14:05  
11 MR. HAGSTROM: When we're off the record, I 05:14:05  
12 will. 05:14:08  
13 MR. GEE: Okay. 05:14:08  
14 THE WITNESS: Are you gentlemen done? 05:14:10  
15 BY MR. GEE: 05:14:12  
16 Q Yes. 05:14:12  
17 A I'm teasing you. I included some figures 05:14:12  
18 in my expert report to help answer that question. 05:14:18  
19 Q Okay. 05:14:24  
20 A If you -- in my expert report, PDF page 05:14:25  
21 139, I include a portion of the Dibblee map, and 05:14:32  
22 then show the outline of the SIC site. 05:14:41  
23 Q You'll have to slow down. I'm not as fast 05:14:47  
24 of a scroller as you are. 05:14:50  
25 A That's okay. It's on PDF page 139. 05:14:51

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1 Q Okay. Whoops, I got to 140. Let me rotate 05:15:13  
2 this map, okay. 05:15:22  
3 So I see a red outline. Is that the SIC 05:15:26  
4 site in the red outline? 05:15:31  
5 A Yes. 05:15:32  
6 Q And so what part is the manufacturing 05:15:37  
7 portion of the site? If I chop off the top cone, 05:15:42  
8 would that be -- would that be a representation 05:15:46  
9 or -- 05:15:48  
10 A If you go down to page 143 -- 05:15:50  
11 Q Okay. 143. Okay. 05:15:55  
12 A -- 143 shows the partial outline of the 05:16:06  
13 site in the little black hatch, and then you can see 05:16:10  
14 the buildings in the manufacturing area. The main 05:16:15  
15 manufacturing area is actually sort of the long 05:16:21  
16 east/west portion of the -- of where the buildings 05:16:24  
17 are. 05:16:29  
18 Does that make sense, Mr. Gee? 05:16:36  
19 Q I'm looking at it. Okay. Now, this 05:16:38  
20 whole -- this whole dotted area is the site itself. 05:16:44  
21 I see several buildings. I see a -- kind of like a 05:16:51  
22 parking lot to the -- looks like to the east of one 05:17:00  
23 of the buildings and parking lot to the north of the 05:17:06  
24 building.  
25 Are you including that building as part of 05:17:09

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1 the manufacturing operation? 05:17:11

2 A The primary manufacturing where they use 05:17:14

3 chemicals was towards the east side of -- you see 05:17:17

4 sort of the elongated area on that figure where it 05:17:21

5 goes sort of the farthest -- the right or the east. 05:17:25

6 Q Okay. 05:17:31

7 A All right. On that farthest eastern-most 05:17:32

8 tip is where the wastewater pond was, and just to 05:17:37

9 the west of that, my understanding is that was the 05:17:41

10 main manufacturing area. Some of these other 05:17:46

11 buildings were used for storage and all kinds of 05:17:51

12 stuff. 05:17:55

13 Q All right. I look at the scale on the 05:17:58

14 lower right-hand corner, it looks like, I don't 05:18:00

15 know, between -- it goes from 0 to 240 feet? 05:18:05

16 A Right. 05:18:11

17 Q Just looking at an approximation from north 05:18:12

18 to south, that would be maybe five or six of those 05:18:17

19 bar increments, just guessing, not looking for 05:18:22

20 anything exact at this point, but does that look 05:18:28

21 about right? 05:18:31

22 A Yes. 05:18:32

23 Q So if it's six bar estimates, that would be 05:18:34

24 about 1500 feet. 05:18:43

25 So 60 degrees, you're saying that the 05:18:49

1       60-degree slope -- you're saying that the 60-degree       05:18:51  
2       slope is a slope that's 1500 feet long?       05:18:52  
3       A       Let's go back to Figure PDF 139.       05:18:57  
4       Q       139, okay.  
5       A       So I can try to explain this figure just a       05:19:28  
6       bit. If you see within the red boundary, there       05:19:30  
7       is -- there is the number 60.       05:19:40  
8       Q       Yes, I see that.       05:19:41  
9       A       Okay. And along with the number 60 is a       05:19:42  
10       little T shape and with the T shape, you see it       05:19:46  
11       above the 60.       05:19:55  
12       Q       Yeah, I see a -- yeah, I see a wiggly line       05:19:57  
13       with another line crossing it. Is that what you're       05:20:03  
14       referring to?       05:20:05  
15       A       Yeah, right above the 60 is -- what that       05:20:06  
16       shows is the direction of the dip of the 60-degree       05:20:09  
17       beds.       05:20:15  
18       If you look at the northern part of the       05:20:19  
19       site, actually you'll see an 80. Right in that       05:20:21  
20       area, they mapped the dipping beds at 80 degrees.       05:20:25  
21       So in the vicinity where these two readings       05:20:35  
22       were taken, the beds -- I used 60 degrees because       05:20:37  
23       it's right next to where the manufacturing area of       05:20:41  
24       the SIC -- SIC site is or was.       05:20:45  
25       Q       Mr. Hokkanen, is that the Santa Clara River       05:20:55



1 that's to the left --

2 THE REPORTER: I'm sorry. Is that the  
3 what?

4 BY MR. GEE: 05:21:00

5 Q Santa Clara River. Is that the Santa Clara 05:21:00  
6 River to the west of the SIC site? 05:21:04

7 A That's the south fork. 05:21:10

8 Q South fork. So that's the south fork of 05:21:11  
9 the Santa Clara River, correct? 05:21:13

10 A Santa Clara River is up at the top of the 05:21:19  
11 page. 05:21:21

12 Q Okay. And what is the groundwater -- what 05:21:21  
13 is the elevation of the SIC site relative to the 05:21:23  
14 south fork of the Santa Clara River? 05:21:29

15 A There's not much difference in the 05:21:32  
16 elevation. I don't know off the top of my head, 05:21:40  
17 but it's probably slightly above the south fork. 05:21:42  
18 It's not a lot. I don't know the exact number. I 05:21:46  
19 don't believe there's a lot elevation in that area. 05:21:49

20 Q So if I take an 80-degree slope to the 05:21:55  
21 north, that's a 60-degree slope to the manufacturing 05:21:58  
22 section, don't I go below the river bed level pretty 05:22:01  
23 quickly? 05:22:07

24 A I believe you would be below the river bed, 05:22:10  
25 yes. 05:22:17

1 Q Okay. Did we see any contamination from 05:22:17  
2 the Saugus Industrial Center in the river bed area? 05:22:24  
3 A In the river bed meaning in the sediments? 05:22:28  
4 Or I'm confused. 05:22:33  
5 Q The sediments, the south fork of the Santa 05:22:34  
6 Clara River -- 05:22:38  
7 MR. HAGSTROM: I couldn't hear. 05:22:39  
8 BY MR. GEE: 05:22:42  
9 Q Either the sediments or in the -- in the 05:22:42  
10 south fork of the Santa Clara River, I mean did you 05:22:45  
11 see any sign of contamination in that area at all? 05:22:49  
12 A Well, I don't believe the sediments or the 05:22:52  
13 south fork water have been sampled. However, there 05:22:56  
14 are wells screened in the alluvium right next to 05:23:00  
15 Saugus-1. That's AL-12a and AL-12b. 05:23:05  
16 Q Okay. And have those -- are those 05:23:11  
17 monitoring wells? 05:23:14  
18 THE REPORTER: We lost Mr. Hagstrom. 05:23:16  
19 THE WITNESS: Those are monitoring wells. 05:23:20  
20 BY MR. GEE:  
21 Q Okay. And what have they shown? 05:23:23  
22 A Saugus 12a and 12b have both shown 05:23:27  
23 chloroform detections and TCE detections. The 05:23:33  
24 highest concentrations have been detected in the 05:23:37  
25 deeper well which is Saugus -- or excuse -- me 05:23:40

1 AL-12b. 05:23:44

2 And I believe that well is -- the total 05:23:47

3 depth of about 180 feet. 05:23:50

4 Q Okay. And 180 feet, does that -- does that 05:23:56

5 reach the -- the Saugus Formation? 05:23:58

6 A Those wells are screened in the alluvial 05:24:04

7 materials. 05:24:07

8 Q Okay. I thought that the -- that the -- 05:24:08

9 that sanitary sewer for -- or sanitary seal for 05:24:14

10 Saugus-1 and Saugus-2 were around 450 feet below -- 05:24:19

11 below ground surface; is that about right? 05:24:26

12 A Your memory is good, sir. 05:24:28

13 Q Okay. I've been looking at some of these 05:24:30

14 wells for a while. 05:24:34

15 Now, what kind of impact would the -- would 05:24:38

16 the sanitary seals have on potential contamination 05:24:42

17 coming from the SIC site? 05:24:45

18 A Are you talking about TCE, for example, in 05:24:47

19 the alluvium? 05:24:56

20 Q Yes, let's say that. 05:24:58

21 A Well, the purpose of the sanitary seal is 05:25:03

22 to prevent groundwater from anything 450 feet and 05:25:05

23 above from entering the well. That's the purpose of 05:25:12

24 the seal. 05:25:15

25 Q Okay. 05:25:15

1           A     Is it providing 100 percent seal of that           05:25:16  
2           groundwater?           05:25:22  
3                   I don't think anyone has tested that, but           05:25:25  
4           the purpose of it is to block off groundwater above           05:25:29  
5           450 feet.           05:25:33  
6           Q     Okay. Is there any evidence that the           05:25:34  
7           sanitary seal was not effective in blocking           05:25:36  
8           contamination in the -- in the area 450 feet above           05:25:43  
9           or above the sanitary seal?           05:25:51  
10          A     Based on the information I've looked at, I           05:25:58  
11          don't think the seal itself has been tested for           05:26:01  
12          integrity.           05:26:07  
13          Q     Okay. So in other words, there's no data           05:26:08  
14          that shows that it has or has not been effective           05:26:10  
15          in -- in preventing contamination from the SIC site           05:26:18  
16          to migrating into the Saugus-1 and Saugus-2 wells?           05:26:27  
17          A     In the alluvial material, that's -- that's           05:26:32  
18          my understanding. I don't think anyone has looked           05:26:35  
19          at that.           05:26:38  
20          Q     Okay. And the contamination that we see in           05:26:38  
21          Saugus-1 and Saugus-2, is that -- is that in           05:26:41  
22          hydrostatic unit S-1?           05:26:47  
23          A     Neither well is screened in S-1.           05:26:48  
24          Q     Okay. What is the highest screen? Is it           05:26:52  
25          S-3a?           05:26:58

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1 Saugus Formation. Based on an examination of the 05:29:05  
2 wells and the boring logs, RAMCO, and I confirmed 05:29:08  
3 it, concluded that over half the wells at the SIC 05:29:13  
4 site are actually screened within the top of the 05:29:17  
5 Saugus Formation, not the alluvial formation. 05:29:24

6 And so the plausible pathway is 05:29:26  
7 contamination that has been identified in wells on 05:29:30  
8 the SIC site and actually across the way, the MW-13 05:29:34  
9 wells with the 60-degree dipping bed, groundwater 05:29:42  
10 and anything dissolved in it then will be downward 05:29:47  
11 to the southwest as the dipping angle shows -- the 05:29:51  
12 direction shows right straight in the direction of 05:29:54  
13 Saugus-1 and 2 moving down those -- those dipping 05:29:59  
14 beds. 05:30:02

15 Q Okay. And I guess the question -- I 05:30:03  
16 thought I might have asked earlier, but how long are 05:30:08  
17 these dipping beds? Are they a foot, ten feet? 05:30:11

18 A Laterally, is that what you mean? 05:30:18

19 Q No, I mean -- I mean, yeah, let's say 05:30:21  
20 laterally and -- now, the dipping bed, are they like 05:30:24  
21 solid rock formations? 05:30:28

22 A Yes, it's -- it's -- the Saugus Formation 05:30:32  
23 is what we call consolidated material. It's -- 05:30:35  
24 unconsolidated material is like sand or gravel you 05:30:40  
25 hold in your hand and it's not cohesive. 05:30:43

1           The Saugus Formation is basically cohesive           05:30:46  
2           material. You might call it rock, for example, and,           05:30:50  
3           yes, that -- those beds that have been laid down in           05:30:55  
4           the past have then been uplifted at that 60-degree           05:30:59  
5           angle.           05:31:04

6           Those beds are essentially laterally, if           05:31:05  
7           that's what your question, essentially are uplifted           05:31:08  
8           in conjunction with the San Gabriel fault. So they           05:31:13  
9           extend quite a distance.           05:31:16

10          Q       Okay.           05:31:20

11          A       How they transition from 60 degrees down to           05:31:21  
12          the regional of the Saugus at 10 to 15, as I           05:31:23  
13          testified earlier, that's not exactly known, but the           05:31:28  
14          transition between the SIC site does happen.           05:31:32  
15          Exactly how and between the SIC site and the Saugus           05:31:38  
16          wells, I'm not certain.           05:31:42

17          THE REPORTER: I'm sorry. What was the           05:31:46  
18          very last word you said?           05:31:47

19          THE WITNESS: It's not certain.           05:31:49

20          BY MR. GEE:           05:31:50

21          Q       Okay. So, Mr. Hokkanen, the description of           05:31:50  
22          these beds as being solid rock, in your experience,           05:32:03  
23          would it be difficult to draw a monitoring well           05:32:07  
24          through solid rock?           05:32:12

25          A       Well, the Saugus -- or the SIC site that           05:32:14

1           they drilled into is not consolidated material.           05:32:18

2           It's been weathered. When it was originally laid           05:32:22

3           down, the top surface weathered, and it's not           05:32:25

4           completely solid rock. So it's a mix of           05:32:29

5           unconsolidated materials and a little bit more           05:32:34

6           consolidated materials.           05:32:36

7           Q       Okay. So if we drill a hole there right           05:32:38

8           now today, are you saying that we wouldn't find           05:32:42

9           solid rock where the protrusion is?           05:32:45

10          A       If you drill down far enough, you would           05:32:48

11          find solid rock, but, again, as I testified earlier,           05:32:52

12          the depth of impact at the SIC site hasn't been           05:32:56

13          determined. The deepest wells out there are 180           05:33:03

14          feet.           05:33:06

15          Q       Okay.           05:33:06

16          A       So where it transitioned from           05:33:07

17          unconsolidated to more solid, that hasn't been           05:33:12

18          determined at the SIC site.           05:33:14

19          Q       All right. So are you saying that the --           05:33:15

20          that that solid protrusion is fairly deep beneath           05:33:22

21          the SIC site below 180 degrees --           05:33:26

22                  THE REPORTER: 188?           05:33:32

23                  MR. HAGSTROM: I'm sorry. Could you read           05:33:34

24          that back, Linda, because I -- Byron broke up a           05:33:35

25          little bit.           05:33:41



1 (The record was read as follows:  
2 "Q So are you saying that the --  
3 that that solid protrusion is  
4 fairly deep beneath the SIC site  
5 below 188 --")  
6 THE REPORTER: I didn't know if you said  
7 188 or 180. 05:33:51  
8 MR. GEE: Yeah, 180 feet where the wells 05:33:51  
9 are. 05:33:58  
10 THE WITNESS: Solid material, is that what 05:33:59  
11 your question included? 05:34:02  
12 MR. GEE: Yes. 05:34:02  
13 Q You said that that material would be solid 05:34:03  
14 rock and that you would -- as you reach farther 05:34:07  
15 down, you would reach solid rock, is that what -- 05:34:12  
16 what you indicated? 05:34:15  
17 THE REPORTER: Can you mute, Earl, please? 05:34:18  
18 THE WITNESS: It hasn't been determined at 05:34:20  
19 the SIC site. 05:34:21  
20 BY MR. GEE: 05:34:26  
21 Q So are you testifying right now that we 05:34:26  
22 don't know how deep that rock could be today? 05:34:34  
23 A At the SIC site, the deepest well drill is 05:34:43  
24 180 feet, and I don't believe they hit the more 05:34:47  
25 solid Saugus Formation material. However, it is the 05:34:51

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1 Saugus. It's weathered Saugus material. 05:34:54

2 Q And what's the characteristics of the 05:34:57

3 Saugus material in terms of how does that impact 05:35:02

4 groundwater flow and -- and migration through the 05:35:05

5 vadose zone beneath the Saugus Industrial Center 05:35:15

6 site? 05:35:17

7 THE REPORTER: What kind of soil? Veno? 05:35:18

8 BY MR. GEE:

9 Q How does the, I guess, decomposed rock 05:35:25

10 formation impact the fate and transport of water and 05:35:32

11 contamination through the vadose zone beneath the 05:35:39

12 SIC site? 05:35:45

13 A The vadose zone at the SIC site is mostly 05:35:47

14 alluvial material. There might be some Saugus. The 05:35:55

15 water -- water table at the SIC site, like the whole 05:35:57

16 area has been dropping -- or did drop due to the 05:36:01

17 drought. It's come back up a little bit. 05:36:08

18 How would it impact it? I'm not sure how 05:36:10

19 to answer that. Material moves through it, just 05:36:13

20 like it does -- essentially like the alluvial 05:36:17

21 material. 05:36:21

22 Q Okay. So if it has a similar 05:36:21

23 characteristic and the fate and transport of 05:36:29

24 groundwater and contamination moved through that 05:36:30

25 material at about the same rate as the alluvium, 05:36:34

1       how -- how does that material impact the migration       05:36:37  
2       of contamination down to the groundwater beneath the       05:36:45  
3       SIC site?       05:36:55  
4             A       Well, it's hard to answer that question       05:36:56  
5       because, as I testified to earlier, the -- the       05:36:59  
6       contamination and the groundwater flow paths       05:37:05  
7       vertically have not been characterized at the site.       05:37:09  
8             Again, there are deep wells -- 180 feet       05:37:15  
9       wells that show high levels of TCE. How deep that       05:37:17  
10      goes vertically has not been determined.       05:37:22  
11             Again, back to your question --  
12             THE REPORTER: I'm sorry. How deep that  
13      goes vertically? Hold on.  
14             THE WITNESS: Did you get that?  
15             THE REPORTER: I hope so. I think so. I       05:37:48  
16      don't know.  
17             "There are deep wells 180 feet that show  
18      high levels of TCE. How deep that goes vertically  
19      has not been determined." That's what I got.  
20             THE WITNESS: Yes.       05:37:49  
21             MR. GEE: Okay.       05:37:51  
22             THE WITNESS: And, similarly, what the --       05:37:51  
23      you know, what the vertical gradients are and their       05:37:53  
24      relation to the dipping beds of the Saugus have also       05:37:58  
25      not been determined because we don't have deeper       05:38:02

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1 wells. 05:38:05

2 I think previously you asked me what 05:38:06

3 information we would need to characterize this. It 05:38:08

4 would be deeper wells, get water levels, get water 05:38:12

5 quality data. 05:38:17

6 BY MR. GEE: 05:38:19

7 Q Okay. Well, if we have to go that deep, 05:38:19

8 how did Dibblee even determine that these formations 05:38:23

9 exist? 05:38:28

10 A Well, there have been studies in this area 05:38:29

11 for, I don't know how long, decades. Many people 05:38:36

12 have studied this area through boring logs from 05:38:42

13 various wells. 05:38:45

14 Accumulation of that information has been 05:38:50

15 used to determine Saugus, how deep it is. It's now 05:38:53

16 recently more the differentiation of the sites 05:38:57

17 Saugus-3a and 5 and this sort thing, and that's 05:39:02

18 primarily done through the borings and the 05:39:04

19 subsequent monitoring wells in those borings. 05:39:07

20 Q And when you looked at the Dibblee report, 05:39:10

21 how close were the borings that he used in his 05:39:13

22 analysis to the SIC site? 05:39:16

23 A Well, he didn't use borings to characterize 05:39:21

24 the dipping beds. He used surface expression of 05:39:23

25 those beds to make that determination. 05:39:26

1 Q And can you explain that to me? I don't 05:39:30  
2 understand what he did and how he concluded that 05:39:34  
3 those formations existed. 05:39:39  
4 A Well, if you notice on the Dibblee map, the 05:39:47  
5 determination of the 60-degree dipping bed is not in 05:39:51  
6 the alluvial materials. It's up in the foothills 05:39:53  
7 next to the alluvial material. 05:39:53  
8 And you can actually observe and then 05:39:56  
9 measure the angle that beds are dipping based on 05:40:00  
10 surface expressions, and that's, I believe -- I mean 05:40:04  
11 I haven't talked to Mr. Dibblee, but that's 05:40:07  
12 generally how you do that. 05:40:10  
13 Q But what you're saying is that we haven't 05:40:11  
14 dug down that deep to really have any information on 05:40:21  
15 these dipping -- dipping formations, do we? Is that 05:40:24  
16 correct? 05:40:30  
17 MR. HAGSTROM: I'm going to object that 05:40:31  
18 that mischaracterizes his testimony. 05:40:32  
19 Go ahead, Mr. Hokkanen. 05:40:34  
20 THE WITNESS: What this is -- what we're 05:40:35  
21 looking at in number 34 is a portion of the Dibblee 05:40:41  
22 map where he has mapped at the surface -- surface 05:40:46  
23 expressions of the Saugus Formation. He then 05:40:51  
24 measured the angle that these Saugus Formation was 05:40:54  
25 dipping at those locations. 05:40:59

1 BY MR. GEE: 05:41:04

2 Q Okay. And what do those surface formations 05:41:04

3 look like that identify these dipping sticks? Is it 05:41:08

4 a different colored rock? Is it a -- is it to do 05:41:13

5 that based on the hardness of the medium? I just 05:41:16

6 don't understand what -- what he was looking at when 05:41:20

7 he made this determination. 05:41:24

8 A I think my answer is I wasn't there with 05:41:26

9 Mr. Dibblee when he made these measurements. So I'm 05:41:32

10 not sure. 05:41:35

11 Q Okay. I'm not talking about what he 05:41:35

12 measured, but I'm talking about what he observed 05:41:39

13 that led to the conclusion that these dipping -- 05:41:44

14 dipping formations exist. 05:41:51

15 MR. HAGSTROM: Objection; lacks foundation, 05:41:53

16 calls for speculation. 05:41:55

17 THE WITNESS: Mr. Gee, I have the same 05:42:01

18 answer. I was not there. I will tell you that 05:42:02

19 Mr. Dibblee's map is an extremely well-regarded map 05:42:07

20 of the geology in this area. 05:42:11

21 It's used extensively by geologists to 05:42:14

22 understand different formations and the angle of 05:42:19

23 these Saugus beds, the San Gabriel fault where, for 05:42:24

24 example, alluvial materials are located where 05:42:28

25 surface expressions of the Saugus Formation are 05:42:31

1 located. 05:42:34

2 It's an extremely well-regarded reference. 05:42:34

3 Exactly how he did those measurements that we saw, I 05:42:37

4 don't know.

5 BY MR. GEE: 05:42:47

6 Q Did Mr. Dibblee write a book or anything 05:42:47

7 like that that would shed any kind of light how he 05:42:50

8 goes about doing the work that he did? 05:42:55

9 A I believe he provides references, not only 05:42:56

10 work that he's done, but like I mentioned, there are 05:43:02

11 decades of work in this area to be able to develop a 05:43:06

12 map like this. Years and years and years of work by 05:43:10

13 various field geologists to develop this map. 05:43:14

14 Q But sitting here today, we don't know -- we 05:43:23

15 don't see any evidence of those dipping formations; 05:43:28

16 is that correct? We haven't run into that solid 05:43:32

17 rock. We think it's there, but we don't have any 05:43:37

18 physical evidence through boring logs that -- that 05:43:43

19 support that theory. 05:43:46

20 A Actually I'll go back to the RAMCO modified 05:43:48

21 geology report that I mentioned. This was a 05:43:54

22 consultant of SIC. They did a lot of work at the 05:43:56

23 site.

24 This particular report, they sent out a 05:44:00

25 geologist to the site. They verified similarly I 05:44:02

1 suppose to Dibblee surface expressions of these 05:44:08

2 dipping beds. 05:44:13

3 They then developed cross-sections, which I 05:44:14

4 have in my figures based on the boring logs that 05:44:16

5 show these dipping beds. 05:44:22

6 These are, for example, I included three of 05:44:24

7 the figures from this modified geology report that 05:44:28

8 gives 35, 36, and 37. 05:44:32

9 Q And did the RAMCO report do any analysis as 05:44:38

10 to what the impact of these dipping formations are 05:44:47

11 on groundwater flow? 05:44:49

12 A I believe it was primarily a geology 05:44:51

13 report. I don't believe they went into the 05:44:54

14 hydrogeology. 05:44:57

15 Q Okay. So have you done any independent 05:44:58

16 studies to determine what the impact of these 05:45:01

17 dipping formations has on the hydrogeology beneath 05:45:06

18 the site? 05:45:10

19 A Have I collected field data, is that your 05:45:11

20 question, sir? 05:45:15

21 Q Done any analysis. It can include field 05:45:15

22 data or it just might be just other type of analysis 05:45:18

23 that a hydrogeologist -- that hydrogeologists do, 05:45:24

24 whatever that might be. 05:45:30

25 A No, I -- I mean the first thing you would 05:45:31



1 do is to use the information that I've already 05:45:33  
2 talked about, and, again, like I said, I did not 05:45:36  
3 call this a pathway. I call this a plausible 05:45:42  
4 pathway based on the geology. 05:45:47

5 Q Okay. All right. So is it fair to say 05:45:49  
6 that these dipping formations may exist, probably 05:45:57  
7 exist, but we don't know what the impact of these 05:46:02  
8 dipping formations are? 05:46:04

9 A Well, I think there's verification that 05:46:08  
10 they do exist. It's based on field geology 05:46:11  
11 information. It's based on boring logs at the 05:46:16  
12 actual SIC site. 05:46:18

13 And based on that geology, my conclusion is 05:46:20  
14 that -- is that it is a plausible pathway because 05:46:27  
15 groundwater underneath the SIC site could follow 05:46:30  
16 these dipping beds. 05:46:36

17 The Saugus Formation, as we've talked about 05:46:37  
18 earlier, under the Whittaker site, groundwater moves 05:46:39  
19 through these parts of the Saugus Formation. It so 05:46:43  
20 happens that part of the Saugus Formation has been 05:46:47  
21 uplifted underneath the SIC site. 05:46:50

22 Q Okay. Mr. Hokkanen, the dipping formations 05:46:55  
23 appear to be dotted lines. 05:46:59

24 Does that suggest that we don't know 05:47:01  
25 exactly how long they are, what their location is, 05:47:03

1 and how deep they extend or am I just or is there 05:47:09  
2 some other reason? 05:47:18  
3 A Well, I didn't develop these particular 05:47:19  
4 figures. I think there might be some uncertainty 05:47:22  
5 because you have a -- as you usually do, a limited 05:47:26  
6 number of borings. 05:47:30  
7 However, they basically based on the 05:47:33  
8 borings and the information they collected in their 05:47:37  
9 field geology effort that's included in the report, 05:47:41  
10 they concluded that these beds were indeed dipping 05:47:46  
11 at these angles. 05:47:50  
12 Q Okay. Yeah, I was just looking for a 05:47:54  
13 legend on these drawings, and I just don't see a 05:47:57  
14 legend that would give me any insight as to what 05:48:00  
15 some of these figures represent. 05:48:03  
16 Did your review of the Dibblee book come 05:48:09  
17 with a legend that may -- may shed more light in 05:48:12  
18 terms of what these representations mean? 05:48:16  
19 A Are we talking about figure -- which figure 05:48:21  
20 are you talking just so we're clear? 05:48:24  
21 Q Well, actually I was looking at the figure 05:48:26  
22 on page 141, but I just noticed that that's a RAMCO 05:48:30  
23 figure. 05:48:33  
24 A That is indeed. That's from the modified 05:48:34  
25 geology report. 05:48:36

1 Q Okay. And did -- is 139 from the Dibblee 05:48:37  
2 report? 05:48:44  
3 A That's the Dibblee map, yes. 05:48:48  
4 Q Okay. And the Dibblee map doesn't really 05:48:50  
5 have any interpretation as to what angles these 05:48:57  
6 dipping sticks are? Is that -- did the -- oh, wait. 05:49:00  
7 I'm sorry. They do have numeric -- numeric 05:49:08  
8 representations. 05:49:11  
9 A Yes. The number is the -- is the degree as 05:49:14  
10 we talked about from horizontal, and then as we put 05:49:18  
11 a little legend in the bottom left-hand corner 05:49:21  
12 there, the little long T shape. 05:49:25  
13 Q Uh-huh. 05:49:27  
14 A That shows the -- the angle and direction 05:49:28  
15 of the dipping bed. 05:49:34  
16 Q Okay. And that was part -- that was 05:49:35  
17 actually on the Dibblee report or was that something 05:49:38  
18 that you added later on? 05:49:40  
19 A We added that so you -- when -- when the 05:49:41  
20 attorneys were looking at this figure, they could 05:49:45  
21 understand what this Dibblee map said. 05:49:47  
22 There is an indication -- the Dibblee map 05:49:51  
23 is much, much bigger than this. I didn't want to -- 05:49:53  
24 I wanted to show this area. So we took a portion. 05:49:55  
25 So if you look at the actual Dibblee map, it has a 05:50:00

1 legend that shows all of this information. 05:50:04

2 MR. GEE: Okay. And like at some point, 05:50:09

3 can you produce the legend so that we can interpret, 05:50:13

4 you know -- see what these -- what the information 05:50:18

5 represented in this figure is? 05:50:22

6 MR. HAGSTROM: It's a publicly available 05:50:26

7 map, but we -- we'll send you a photostat of the 05:50:28

8 legend on the map. 05:50:32

9 MR. GEE: Okay. Thank you, Mr. Hagstrom. 05:50:34

10 Okay. That's all the questions I had on 05:50:42

11 your opinion number six. So, Mr. Sinclair, I'm 05:50:44

12 going to turn it over to you. 05:50:51

13 THE WITNESS: Can I get two minutes for a 05:50:54

14 bathroom break? I'll put on the record. 05:50:56

15 MR. GEE: You can take five. 05:50:58

16 THE VIDEOGRAPHER: We're going -- we are 05:51:02

17 going off the record at 5:50. 05:51:06

18 (Recess taken.) 05:59:19

19 THE VIDEOGRAPHER: We're back on the 05:59:20

20 record. The time is 5:59. Please proceed. 05:59:28

21

22 EXAMINATION

23 BY MR. SINCLAIR: 05:59:32

24 Q Okay. Mr. Hokkanen, my name is Murray 05:59:32

25 Sinclair. I represent Saugus Industrial Center, 05:59:36

1        LLC. I appreciate your patience. It's been a long        05:59:39  
2        day, and I'm going to try to ask focused questions.        05:59:46  
3        I don't want to be here any longer than you do.        05:59:51  
4                So I'm going to go directly into your        05:59:54  
5        rebuttal report to Robert Gailey's expert report,        06:00:00  
6        and then we're going to talk about your opinion on        06:00:08  
7        BFPP defense.        06:00:13  
8                (The document referred to was marked by the  
9        Reporter as Deposition Exhibit 320 for  
10        identification and is attached hereto.)  
11        BY MR. SINCLAIR:  
12                Q        First of all, I wanted to track back to --        06:00:15  
13        to your qualifications and your background. You've        06:00:21  
14        got a BS in civil engineering from the University of        06:00:27  
15        Minnesota, correct?        06:00:31  
16                A        Yes.        06:00:33  
17                Q        Okay. And a master's from the University        06:00:35  
18        of Waterloo.        06:00:40  
19                Do you -- is that correct also?        06:00:41  
20                A        Yes.        06:00:45  
21                Q        Do you have -- or have you had any licenses        06:00:46  
22        or certifications related to your career as an        06:00:54  
23        engineer and hydrogeologist?        06:01:00  
24                A        Yes, I was licensed for a number of years        06:01:04  
25        as a PE in Minnesota, and then I moved to        06:01:09

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1 California, and I haven't been licensed in 06:01:12  
2 California. 06:01:15  
3 Q When did you move to California? 06:01:17  
4 A That was about 2002, I believe. 06:01:19  
5 Q Did you take any licensing exams after you 06:01:36  
6 moved to California? 06:01:42  
7 A No. 06:01:43  
8 Q Any particular reason why you decided not 06:01:43  
9 to be licensed when you -- when you moved to 06:01:49  
10 California? 06:01:53  
11 A No particular reason. Just never did it. 06:01:55  
12 Q All right. In your -- in your rebuttal 06:02:03  
13 expert report to Robert Gailey's expert report, you 06:02:11  
14 provide details of specific groundwater elevation 06:02:18  
15 contour datasets for the SIC site. 06:02:22  
16 I'd like you to look at pages 7 to 9 of the 06:02:27  
17 report, and let me know when you're -- you're there. 06:02:30  
18 A Yep. 06:02:40  
19 Q Why did you -- why did you use only those 06:02:41  
20 the particular datasets that you used? 06:02:55  
21 A You're referring to Figure B and Figure C; 06:03:03  
22 is that correct? 06:03:06  
23 Q Yeah. And also the -- go ahead. 06:03:15  
24 A Well, those were -- as I say in the text, 06:03:25  
25 those were two examples I used, and then I included 06:03:30

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1 others back in one of the appendices of the 06:03:36  
2 attachments what I call them. So these were two 06:03:44  
3 that I put in the text, and then I included other 06:03:49  
4 ones as attachments. 06:03:53  
5 Q And can you tell me what percentage of the 06:03:59  
6 available that these datasets you used represent? 06:04:02  
7 A Figures B and C, and then the ones in the 06:04:10  
8 back. 06:04:13  
9 Q Yeah. 06:04:15  
10 A Let's see. The first figure, Figure B is 06:04:16  
11 from 2012. There were some water table maps prior 06:04:27  
12 to that that I didn't include primarily because 06:04:34  
13 there were quite a few less wells. 06:04:40  
14 As, for example, the GW-13 wells were put 06:04:45  
15 in and included in these flow maps, it started to 06:04:49  
16 show this westerly southwesterly flow, didn't count 06:04:55  
17 up all the maps I included in the back. 06:05:01  
18 If you'd like me to do that, I can, but 06:05:04  
19 it -- I didn't include every single map through this 06:05:12  
20 period and it started in 2012, as I mentioned, 06:05:20  
21 because there were enough wells to show this 06:05:23  
22 pattern. 06:05:26  
23 And then as I indicated in the text, as the 06:05:28  
24 water table dropped during the drought, a lot of 06:05:30  
25 these shallow wells went dry. And so there weren't 06:05:36

1 enough wells to really draw a comprehensive water 06:05:41  
2 table map. There are other wells as you're 06:05:45  
3 indicating -- excuse me -- other maps that I did not 06:05:48  
4 include. 06:05:50  
5 Q So what -- can you give me any number in 06:05:50  
6 terms of what percentage of the available data you 06:05:57  
7 used? 06:06:01  
8 A I'm hesitating because I really didn't -- 06:06:01  
9 didn't look at that. So give me a few minutes. I'm 06:06:13  
10 trying to remember when the water table dropped so 06:06:44  
11 much that most of these wells were bad or couldn't 06:06:47  
12 get water levels, yes. 06:06:51  
13 So from about 2012 -- in about 2011 to 2013 06:06:55  
14 was when there were enough wells in my opinion to 06:07:04  
15 draw this more comprehensive map. It looks -- I 06:07:07  
16 could -- it looks like I've included roughly half 06:07:13  
17 the maps, I don't know, something like that. 06:07:16  
18 Q All right. And I notice that you reference 06:07:20  
19 results that include dashed contoured lines -- 06:07:27  
20 contour lines where in other parts of your report -- 06:07:30  
21 your initial expert report and your rebuttal 06:07:41  
22 reports, you indicate that reliance in dash lines is 06:07:46  
23 problematic. 06:07:49  
24 Did you -- did you rely upon these dash 06:07:55  
25 line contour maps because that was the only evidence 06:08:00



1 available or what was your reasoning? 06:08:04

2 A Actually I didn't really rely so much on 06:08:08

3 the lines that somebody drew. I relied on the water 06:08:11

4 levels that were measured in the wells. 06:08:15

5 Q At bottom of page 9, you indicate the 06:08:28

6 groundwater flows in different directions in the 06:08:31

7 eastern and western portions of SIC site. 06:08:34

8 Do you contend that this is a constant 06:08:39

9 feature of the groundwater flow system? 06:08:42

10 A What I -- based on the water levels that I 06:08:45

11 looked at, there is variability. As I mentioned on 06:08:50

12 the Bermite site earlier today, given recharge 06:08:56

13 events and time of the year and -- and the 06:08:58

14 groundwater, flow directions are variable. 06:09:01

15 And during some of the events there was, as 06:09:04

16 I indicate in this section, on the west side of the 06:09:08

17 site, there's a westerly flow based on the water 06:09:13

18 levels. 06:09:19

19 Q I have no idea what this question means, 06:09:30

20 but, frankly, Mr. Gailey wanted me to ask you this. 06:09:33

21 So I'm going to. 06:09:37

22 What is the source of the water for the 06:09:43

23 flow divide? I have no idea what that question 06:09:44

24 means, but he seemed to think it was important and I 06:09:48

25 thought I would ask you. 06:09:52

1           A     What is the source of the water, is that           06:09:53  
2           the question?           06:09:57  
3           Q     Yeah. What is the source of the water for       06:09:59  
4           the flow divide?       06:10:03  
5           A     Well, the source of the water -- the           06:10:06  
6           shallow water -- and this is water right at the       06:10:09  
7           surface, what we call the water table, most of that    06:10:12  
8           water -- well, it's a combination.           06:10:16  
9           Some of that water flows onto the site from       06:10:20  
10          off-site because the SIC site and the alluvial       06:10:24  
11          aquifer and the weathered Saugus that I talked about   06:10:28  
12          are part of a bigger system.           06:10:31  
13          So some of the water comes and flows from       06:10:34  
14          an off-site location, and then some of the water       06:10:36  
15          also comes from recharge. So it rains, infiltration    06:10:40  
16          down to the water table.           06:10:46  
17          Q     In your rebuttal to Mr. Gailey's report,       06:10:54  
18          you refute Mr. Gailey's opinion that there is little    06:10:59  
19          direct hydraulic communication between the shallow    06:11:04  
20          and deeper parts of the groundwater system.       06:11:08  
21          And with regard to that, I want to ask you       06:11:13  
22          what your basis is for stating that the upper       06:11:16  
23          surface of the Saugus Formation easily transmits       06:11:20  
24          groundwater. You say this at page 10.           06:11:24  
25          A     Whereabouts are you? I remember this, but       06:11:33

1 I would just like to look at it. 06:11:36

2 Q Yeah, this is at -- I'm on -- 06:11:38

3 A Section 4.2? 06:11:57

4 THE REPORTER: I'm sorry. Objection what?

5 I'm sorry. Who objected? Did somebody object?

6 THE WITNESS: No. Section 4.2?

7 BY MR. SINCLAIR:

8 Q Yes. Section 4.2 of the fourth full 06:12:01

9 paragraph at the end of that paragraph. 06:12:06

10 A Yes, okay. The sentence reads, "However, 06:12:11

11 the upper surface of the Saugus Formation at the SIC 06:12:14

12 Site is generally unconsolidated and porous, easily 06:12:19

13 transmitting groundwater." Unconsolidated material, 06:12:23

14 and above that, I describe what that material is. 06:12:27

15 It's fairly large grained material -- unconsolidated 06:12:31

16 large grained material. It has a high hydraulic 06:12:38

17 conductivity and easily transmits groundwater. 06:12:42

18 Q And does this statement square with the 06:12:45

19 information that was provided in the geology report 06:12:48

20 by RAMCO? 06:12:51

21 A I believe it does, yes. They -- I believe 06:12:53

22 they talked about how the upper surface of this -- 06:12:58

23 what they described as the Saugus based on the 06:13:02

24 borings was unconsolidated material. 06:13:05

25 Q On page 11, you also refer to hydrographs 06:13:09

1 for monitoring wells AL-4b and AL-6 in support of 06:13:23  
2 your opinion that Gailey is not correct. 06:13:32  
3 Do you contend that the hydrographs show 06:13:35  
4 shallow groundwater level responses to startup of 06:13:39  
5 Saugus-1 and 2? 06:13:43  
6 A Yes, this is a report that Mr. Gee was 06:13:44  
7 asking me about earlier today. This is the startup 06:13:51  
8 of Saugus-1 and 2, and what the report says is that, 06:13:55  
9 you know, I'll paraphrase, but it says that there 06:14:02  
10 was no immediate response in water level change in 06:14:05  
11 those two alluvial wells, the AL-4b and the AL-6. 06:14:10  
12 However, over the three months that the 06:14:17  
13 wells were pumped, there was a response and from 06:14:20  
14 memory, AL-4b dropped -- water level dropped a 06:14:25  
15 little over six feet. In AL-6, it dropped almost 06:14:29  
16 five feet. 06:14:32  
17 Q Do you see that there's any other 06:14:37  
18 interpretation of the data presented on the 06:14:39  
19 hydrographs? Would there be any other way of 06:14:42  
20 looking at it? 06:14:45  
21 A Well, one possibility is that the water 06:14:46  
22 levels were generally dropping in the area. That's 06:14:49  
23 one interpretation. 06:14:52  
24 And I actually looked at the water level 06:14:54  
25 changes in some of the SIC wells during this period 06:14:58

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1 of pumping, and there actually was a drop in these 06:15:05  
2 alluvial wells and they dropped about a foot or so. 06:15:09  
3 And so it appears that there was indeed a delayed 06:15:13  
4 response in water levels in these two alluvial wells 06:15:17  
5 from the pumping of Saugus-1 and 2. 06:15:23

6 Q In your expert report and your rebuttal to 06:15:28  
7 Gailey's report, you identify a potential migration 06:15:31  
8 pathway from SIC to the Saugus supply wells as 06:15:35  
9 plausible. This is generally on pages 11 to 17. 06:15:39

10 How do you surmount the uncertainty created 06:15:44  
11 by change in dip angle and arrive at a conclusion to 06:15:47  
12 a reasonable degree of scientific certainty? 06:15:51

13 A Well, as I discuss in the report, I 06:15:58  
14 actually don't know what the transition from the 06:16:04  
15 60 degree to the 10 or 15 degree. 06:16:08

16 And so what I did is -- is assume that at 06:16:12  
17 the Saugus wells, the Saugus beds were dipping 10 to 06:16:17  
18 15 degrees. It could be dipping more because that 06:16:22  
19 60-degree dip could extend further than those wells 06:16:27  
20 because they're located pretty close. 06:16:32

21 However, I assumed that they were -- you 06:16:34  
22 were back to the regional dip of 10 to 15. I also 06:16:36  
23 then assumed that you had a transition from 60 to -- 06:16:40  
24 I used 10 or 15, I forget, sir -- that that 06:16:46  
25 transition essentially happened through an arc 06:16:48

1 because of the close proximity of the SIC site to 06:16:52  
2 these two wells, which gives you an average dip, I 06:16:56  
3 think, from memory about 35 degrees or so. 06:17:00

4 The point of that exercise wasn't to say I 06:17:03  
5 know exactly what the dip angle and the transition 06:17:06  
6 is. I was looking to see if those -- that dipping 06:17:10  
7 bed of 60 degrees could intersect the well screens 06:17:14  
8 of Saugus-1 and 2. 06:17:18

9 Q I want to go back to a few things you 06:17:28  
10 testified about earlier, just to make sure I 06:17:30  
11 understood these points. 06:17:33

12 With the perchlorate moving through the 06:17:40  
13 subsurface and creating -- showing that there's a 06:17:42  
14 plausible pathway for the perchlorate to have 06:17:52  
15 reached the wells, you stated that, I believe, and 06:17:57  
16 my -- but your opinion is that the VOCs have not 06:18:01  
17 reached the wells. 06:18:06

18 Well, if there's a plausible pathway, it 06:18:08  
19 would seem to me that the VOCs, at least from your 06:18:13  
20 perspective, are eventually going to reach the 06:18:16  
21 wells. 06:18:19

22 Do you have any opinion as to when that 06:18:20  
23 will occur if it has not already occurred? 06:18:22

24 MR. HAGSTROM: I'm going to object. It's 06:18:27  
25 vague, ambiguous, calls for speculation. 06:18:29

1 THE WITNESS: My answer is that I have not 06:18:35  
2 made an opinion about that. I don't have an -- I 06:18:39  
3 didn't include an opinion about that. 06:18:44  
4 BY MR. SINCLAIR: 06:18:46  
5 Q It may not be in your report, but do you 06:18:46  
6 have any kind of rough opinion as to when that will 06:18:49  
7 occur? 06:18:55  
8 A No. 06:18:56  
9 MR. HAGSTROM: Same -- okay. Go ahead. 06:18:57  
10 We're done. 06:19:01  
11 BY MR. SINCLAIR: 06:19:09  
12 Q And did you -- what is your opinion about 06:19:09  
13 SIC being the source of VOCs at V-201 and V-205? 06:19:14  
14 A Again, I didn't render an opinion on that. 06:19:21  
15 I believe my opinion stated that there was a 06:19:31  
16 plausible pathway to Saugus-1 and 2, if I'm not 06:19:33  
17 mistaken. We can go back and look at the exact 06:19:37  
18 language. My memory is not perfect, sir. 06:19:40  
19 Q Yeah. I can't -- I can't recall if you 06:19:43  
20 said anything specific in your report, but I believe 06:19:46  
21 that in your -- your earlier testimony today, I 06:19:48  
22 think that you -- I don't want to put words in your 06:19:52  
23 mouth, but I thought that you said you didn't have 06:19:56  
24 enough data -- there's not enough existing data to 06:19:58  
25 draw a conclusion one way or the other as to SIC 06:20:03

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1 being the source for VOCs in V-201 or 205. 06:20:08

2 A I believe that was my testimony, yes. 06:20:14

3 Q How did you -- in -- in creating your 06:20:16

4 Figures J through O, how did you create these 06:20:32

5 figures? 06:20:36

6 A Sorry. I missed part of that, 06:20:38

7 Mr. Sinclair. Could you repeat that? 06:20:43

8 Q In creating your figures in your -- I 06:20:44

9 believe in your rebuttal report, you created 06:20:47

10 Figures J through O, and I wanted to know how you 06:20:51

11 went about creating those figures. 06:20:56

12 A Oh, yes, J -- well, J, let's start -- 06:21:03

13 Q Let me -- let me be a little bit more 06:21:08

14 specific. 06:21:11

15 A Sure. 06:21:12

16 Q My dog is playing with her toy behind me. 06:21:12

17 Maybe tell me what your process was for 06:21:27

18 aggregating and analyzing the available data to 06:21:30

19 create those figures. 06:21:33

20 A Okay. Let's -- Figure J, K, L, M, N, O, 06:21:35

21 those figures? 06:21:43

22 Q Yeah, yeah. 06:21:45

23 A Yeah. What I did is I looked at the 06:21:49

24 data -- the water quality data from the quarterly 06:21:54

25 monitoring reports that have been generated since 06:21:59

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1 sampling began in these particular wells that SIC 06:22:02  
2 has installed. 06:22:08  
3 And so what I'm showing here are through 06:22:09  
4 that period of sampling, what the maximum 06:22:13  
5 concentrations are in each of these wells for these 06:22:17  
6 different constituents. 06:22:22  
7 Q And you're talking about wells VE-6 -- 06:22:24  
8 THE REPORTER: I'm sorry. Which wells,  
9 sir?  
10 MR. SINCLAIR: I said and you're talking 06:22:34  
11 about data for wells VE-6, GW-15, GW-4b, and GW-13b. 06:22:36  
12 THE WITNESS: These are all -- those are 06:22:49  
13 all of what are called the GW wells. These were all 06:22:50  
14 of the GW wells installed at the site. 06:22:54  
15 BY MR. SINCLAIR: 06:22:56  
16 Q And did you consider 1,2-DCA data for those 06:22:56  
17 wells? 06:23:04  
18 A I believe that's Figure L. 06:23:04  
19 Q And for VE-6, did you consider vinyl 06:23:15  
20 chloride? 06:23:20  
21 A That's Figure -- that's Figure K. 06:23:20  
22 Q Are you aware from Gailey's expert report 06:23:42  
23 that there is perchlorate on the SIC sites? 06:23:46  
24 A I did see that, and Mr. Gailey did not 06:23:50  
25 provide a reference for that data. 06:23:54

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1 Q Would you -- would you agree that there 06:24:04  
2 must be flow -- 06:24:06  
3 A I looked very briefly -- 06:24:08  
4 THE REPORTER: I'm sorry, sir. You  
5 interrupted, the witness.  
6 THE WITNESS: Excuse me?  
7 THE REPORTER: Can you repeat your answer?  
8 MR. SINCLAIR: I didn't -- I didn't hear 06:24:16  
9 you, Mr. Hokkanen. 06:24:18  
10 THE REPORTER: I didn't either.  
11 THE WITNESS: Oh, I'm sorry. I did see the 06:24:20  
12 reference to perchlorate data. I looked very 06:24:23  
13 carefully at his -- his documents considered list, 06:24:27  
14 and I did not see a reference for that data. 06:24:31  
15 So I couldn't do an independent look at the 06:24:43  
16 data and what it meant or what it didn't mean. So 06:24:47  
17 that's kind of where I left it. 06:24:50  
18 BY MR. SINCLAIR: 06:24:51  
19 Q I don't know if I can address that at the 06:24:51  
20 moment. I'll ask him. 06:24:55  
21 Assuming that's correct, would you agree 06:25:07  
22 that there must be flow onto the site from the 06:25:08  
23 off-site area generally located to the west for the 06:25:12  
24 perchlorate to be present on the SIC site? 06:25:16  
25 A First of all, since I wasn't able to locate 06:25:23

1 the data because I couldn't find a reference for it, 06:25:28  
2 it's very difficult to answer that question. 06:25:33  
3 If indeed there is perchlorate detections 06:25:37  
4 on the site in some of these wells, where it came 06:25:41  
5 from and how it got to those wells would be 06:25:46  
6 something that I would need to look at. 06:25:50  
7 Q Can we take a moment? I'd like to take a 06:25:54  
8 moment and see if I can find his reference to that 06:25:56  
9 data. Can we take a moment? 06:26:02  
10 MR. GEE: Do you want to go off the record, 06:26:12  
11 Murray? 06:26:14  
12 MR. SINCLAIR: Yeah, let's go off the 06:26:14  
13 record for one minute. 06:26:15  
14 THE VIDEOGRAPHER: Thank you. We're going 06:26:17  
15 off the record at 6:26. 06:26:18  
16 (Recess taken.)  
17 THE VIDEOGRAPHER: We're back on the 06:31:00  
18 record. The time is 6:30. Please proceed. 06:31:02  
19 BY MR. SINCLAIR: 06:31:12  
20 Q Mr. Hokkanen, in your expert report and in 06:31:12  
21 your rebuttal to Mr. Gailey's report, you discuss 06:31:15  
22 retardation factors from TCE and PCE ranging from 06:31:19  
23 one to ten. 06:31:25  
24 What is the source of the data upon which 06:31:26  
25 that information was developed? 06:31:28

1           A     That was a quote -- a reference from the           06:31:33  
2           CH2M Hill VOC report, I call it, from 2015, I           06:31:39  
3           believe, and they used a reference to a gentleman by           06:31:46  
4           the name of Dr. Doug McKay's paper for that           06:31:49  
5           information.           06:31:53  
6           Q     And was that based on data from the           06:31:54  
7           Whittaker site?           06:31:59  
8           A     No, that's based on field research that's           06:32:01  
9           been done at numerous research sites around the           06:32:06  
10          country and in Canada.           06:32:09  
11          Q     So not even information in the United           06:32:17  
12          States? I mean --           06:32:20  
13          A     No, that's -- there's -- basically what           06:32:21  
14          Mr. McKay is -- or Dr. McKay and his coauthors did           06:32:25  
15          is they looked at a series of field studies           06:32:29  
16          examining TCE retardation, and that's what they           06:32:36  
17          reported from their review of these field studies.           06:32:40  
18          It's not referenced to the Whittaker site at all.           06:32:44  
19          Q     I see. I think that you may have discussed           06:32:51  
20          this with Mr. Gee previously, but I want to ask you,           06:32:58  
21          do any concentrations at the Whittaker site --           06:33:01  
22          actually -- sorry -- I think that was asked with           06:33:07  
23          regard to the SIC site, but with regard to the           06:33:09  
24          Whittaker site, do any of the concentrations there           06:33:13  
25          indicate the possibility of DNAPL?           06:33:17

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1           A       There -- there I looked at that data in           06:33:21  
2           that regard. There were a couple of wells, and           06:33:24  
3           they're located on the eastern side of the site.           06:33:26  
4           Other than that, no.           06:33:30

5           Q       Would the presence of DNAPL affect           06:33:33  
6           estimated travel times through the unsaturated zone?   06:33:38

7           A       Well, DNAPLs generally will move faster           06:33:43  
8           through the unsaturated zone than dissolved phase       06:33:47  
9           chemicals will.           06:33:52

10                  I couldn't find any -- any data, any           06:33:56  
11           support for DNAPLs being present at the site other       06:34:02  
12           than a general rule of thumb, developed actually by     06:34:06  
13           one of my graduate advisors of a 1 percent of a         06:34:12  
14           solubility level.           06:34:17

15                  It doesn't say that there's DNAPLs there.       06:34:18  
16           It says there's a potential for DNAPL, and so there     06:34:21  
17           were two wells, I believe, that showed levels over     06:34:27  
18           this 1 percent rule of thumb that could indicate the     06:34:30  
19           presence of DNAPLs at those locations.           06:34:35

20           Q       In both your expert report and your           06:34:47  
21           rebuttal to Mr. Gailey's report, you state that         06:34:49  
22           detections of PCE and TCE in monitoring wells           06:34:55  
23           located along the western boundary of OU-4 should be     06:35:00  
24           ignored.           06:35:05

25                  I'm looking at page 32 of your rebuttal         06:35:10

1 report where it says "The historical nondetect 06:35:12  
2 results indicate that these one-time detections 06:35:22  
3 could be due to sampling error, lab error, or from 06:35:26  
4 another VOC source." 06:35:32

5 Can you tell me what your reasoning is for 06:35:37  
6 this statement? 06:35:40

7 A First of all, I don't think I used the word 06:35:46  
8 "ignored," just for the record. I don't believe I 06:35:48  
9 had that word anywhere in my rebuttal report or my 06:35:52  
10 expert report. 06:35:56

11 And, yes, I can answer your question. 06:35:59  
12 First of all, I need to explain -- I think I did in 06:36:03  
13 my expert report -- what a -- what a plume is, what 06:36:07  
14 happens when contaminants are released at a source 06:36:13  
15 dissolved in groundwater, what happens. 06:36:17

16 And very simply what happens is those 06:36:21  
17 chemicals and the continuing source from the 06:36:24  
18 surface, let's say, create an area of groundwater 06:36:28  
19 that contains these dissolved contaminants. 06:36:33

20 We looked at, for example, the perchlorate 06:36:37  
21 plume, the orange plume in one of the figures that I 06:36:39  
22 used from the CH2M Hill VOC report. This source or 06:36:42  
23 sources then create an area of -- of these dissolved 06:36:50  
24 chemicals, but the perchlorate data in the 06:36:56  
25 monitoring wells that Whittaker show, for example, 06:37:00

1 along the western boundary of OU-4, is continuous 06:37:03  
2 detections in those wells. 06:37:07  
3 Quarter after quarter after quarter, 06:37:10  
4 perchlorate is detected. What that shows is that 06:37:12  
5 this area or plume of contamination is, in fact, 06:37:15  
6 migrating and moving through the location of those 06:37:20  
7 wells. 06:37:24  
8 If you get a one-time detection in 30, 40, 06:37:26  
9 50 samples, what that indicates is that there is not 06:37:31  
10 an area or a plume of contamination that is moving 06:37:37  
11 those locations. It's another explanation. 06:37:41  
12 And as I indicated, it could be a sampling 06:37:45  
13 error, get cross-contamination of equipment, for 06:37:48  
14 example, when you sample well to well. It could be 06:37:52  
15 lab error. It could be a number of things. 06:37:55  
16 It could even be a one-time detection from 06:37:59  
17 somewhere, but there's not a plume -- a continuous 06:38:03  
18 plume or area of contamination moving through those 06:38:07  
19 locations. 06:38:13  
20 Q I hear what you're saying, but I mean if 06:38:13  
21 those were possibilities, did you look at any field 06:38:16  
22 data sheets or QA and QC results or anything to 06:38:20  
23 justify that conclusion? 06:38:26  
24 A Well, field data sheets, trying to get -- 06:38:34  
25 trying to detect sampling error, I don't believe was 06:38:37

1 done, and what you need to do, for example, is to 06:38:42  
2 take blank samples of -- between each well off of 06:38:47  
3 the equipment that you use. I don't from memory 06:38:53  
4 believe that was done here. 06:38:58

5 However, again, whatever the reason for 06:39:02  
6 those one-time detections, it shows that there's not 06:39:04  
7 a plume of VOCs moving through the location of those 06:39:09  
8 well nests. 06:39:16

9 Q On page 22 of your rebuttal report, I don't 06:39:21  
10 know if this was intended to be inserted in the 06:39:28  
11 report or this was a mistake, but at the end of the 06:39:31  
12 first full paragraph it says, "Make them ask the why 06:39:37  
13 not PCE question." 06:39:46

14 So I'm -- 06:39:52

15 A Where is your reference? 06:39:53

16 Q On page 22. 06:39:56

17 A I see that, interesting. 06:40:00

18 Q Yes. So what -- what was -- what was meant 06:40:06  
19 by that? 06:40:09

20 A Let me read the paragraph again, sir. 06:40:12

21 Q Okay. The paragraph -- the paragraph 06:40:15  
22 reads, "PCE has been detected on the SIC Site at a 06:40:20  
23 maximum concentration of 160 micrograms per liter 06:40:26  
24 and GW-8 (Figure M). The next highest 06:40:33  
25 concentration" -- "The next highest maximum 06:40:38



1 concentration was detected at GW-13b at 8.6 06:40:41  
2 micrograms per liter. PCE has been detected in 06:40:47  
3 GW-13b only intermittently, four out of 32 sampling 06:40:51  
4 events. During the last sampling event in the 1st 06:40:57  
5 quarter of 2020, PCE was not detected in any of the 06:41:01  
6 monitoring wells. Make them ask the why not PCE 06:41:06  
7 question." 06:41:11

8 A Again, just give me a few minutes if you 06:41:12  
9 don't mind. 06:41:16

10 Q So there's some -- I want to ask you the 06:41:17  
11 why not PCE question. 06:41:21

12 Why wasn't -- do you have an opinion as to 06:41:30  
13 why PCE would not have been detected? 06:41:32

14 A Well, my opinion is that I don't believe 06:41:35  
15 PCE, based on the water quality data that I examined 06:41:40  
16 for SIC, I don't think -- I don't think the SIC site 06:41:44  
17 is the source of PCE to Saugus-1. There's -- just 06:41:50  
18 the data doesn't indicate that. 06:41:54

19 Q Okay. I won't argue with that. 06:41:55

20 A Well, it's -- it's -- there's -- there are 06:42:02  
21 concentrations, as I talk about at length of TCE, 06:42:07  
22 not only on the western side of the SIC site, GW-13b 06:42:11  
23 across the road, and then an AL-12b, but PCE doesn't 06:42:17  
24 make its way, for example, even across the road. 06:42:23

25 So I don't believe it could be -- and the 06:42:28

1 concentrations on the site aren't very high or 06:42:30  
2 intermittent. As you can see on one of the figures 06:42:33  
3 I included, I don't believe it's a source of PCE to 06:42:36  
4 Saugus-1. 06:42:40  
5 Q Okay. Turning to your expert report at 06:42:50  
6 page 31 of your expert report -- 06:42:54  
7 A You're going to have to give me a second, 06:42:57  
8 sir. I'll pull it up. 06:43:03  
9 Q Sure. I think that's Exhibit 314. 06:43:03  
10 A Page 31 -- my page 31? 06:43:08  
11 Q Yeah, yes. 06:43:14  
12 A Okay. I'm there, sir. 06:43:21  
13 Q At the top -- at the top of the page, three 06:43:23  
14 lines down, you state, "According to Jose Diaz, the 06:43:30  
15 DTSC project manager of this site, groundwater 06:43:36  
16 contamination from releases at the site has not been 06:43:42  
17 remediated to DTSC satisfaction and continues to 06:43:45  
18 migrate off the site." 06:43:50  
19 When did Mr. Diaz tell you that? 06:43:59  
20 A It's based on -- you weren't done? 06:44:01  
21 Q I'm sorry. Did -- more concisely, did 06:44:07  
22 he -- did this occur from a phone conversation, an 06:44:14  
23 in-person conversation, something read, or what is 06:44:18  
24 the source? 06:44:23  
25 A I believe the source of that is his 06:44:27

1 deposition transcript. 06:44:29

2 Q Have you ever spoken to Mr. Diaz? 06:44:39

3 A No. 06:44:41

4 Q Have you ever been to the Whittaker site? 06:44:41

5 A No. 06:44:54

6 Q And have you ever been to the SIC site? 06:44:54

7 A No. 06:45:03

8 MR. SINCLAIR: I'm going to need to take a 06:45:17

9 minute to put another document into evidence. So I 06:45:20

10 don't know if we want to go off the record or stay 06:45:22

11 on the record while I do this. 06:45:25

12 THE REPORTER: Mr. Hagstrom, you're muted. 06:45:31

13 You're muted. 06:45:37

14 THE WITNESS: We can't hear you, Earl. 06:45:37

15 MR. HAGSTROM: I said just stay on the 06:45:39

16 record, load it up, and let's keep going. 06:45:45

17 MR. SINCLAIR: Okay. 06:45:48

18 MR. HAGSTROM: Thank you, Linda. 06:45:52

19 THE REPORTER: You're welcome. 06:45:53

20 BY MR. SINCLAIR: 06:47:08

21 Q All right. It's loading. It gave me the 06:47:08

22 right number and it appears to be loading the file, 06:47:12

23 but it's -- but it is the -- not the phase 1 report 06:47:14

24 from RAMCO in its entirety. I took an excerpt of 06:47:21

25 the body of the report in one of the appendices. So 06:47:25

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1 it's about 30 pages. It should load in a moment. 06:47:35

2 MR. GEE: Is that going to be Exhibit 320 06:47:43

3 or is that 321? 06:47:45

4 MR. SINCLAIR: 321. 06:47:46

5 MR. GEE: Okay. 06:47:48

6 (The document referred to was marked by the

7 Reporter as Deposition Exhibit 321 for

8 identification and is attached hereto.)

9 BY MR. SINCLAIR: 06:47:56

10 Q So, Mr. Hokkanen, we're going to move to 06:47:56

11 discussing your expert opinion regarding the bona 06:48:00

12 fide prospective purchaser defense. And that would 06:48:10

13 be opinion seven in your -- in your expert report. 06:48:17

14 So the basic opinion is SIC has not met the 06:48:27

15 criteria to be a bona fide prospective purchaser. 06:48:35

16 Have you ever testified as an expert on the 06:48:40

17 bona fide prospective purchaser defense before? 06:48:42

18 A Not on that particular issue, no. 06:48:46

19 MR. HAGSTROM: Before we continue, I don't 06:48:51

20 see that exhibit and I've refreshed a couple of 06:48:52

21 times. 06:48:57

22 MR. SINCLAIR: I'm looking at Exhibit 06:49:11

23 Share, and it just keeps saying it's loading the 06:49:15

24 file, unfortunately. 06:49:27

25 THE REPORTER: I don't have it either. 06:49:31

1 MR. HAGSTROM: If you have questions that 06:49:38  
2 you can ask while the file is loading, let's -- why 06:49:39  
3 don't we try that, hopefully. 06:49:43  
4 MR. SINCLAIR: I don't know why it won't 06:49:49  
5 load. 06:50:23  
6 MR. HAGSTROM: The exhibit is which number, 06:50:40  
7 Linda? 06:50:42  
8 MR. SINCLAIR: It will be 321. 06:50:43  
9 MR. HAGSTROM: Okay. Thank you. 06:50:44  
10 BY MR. SINCLAIR: 06:50:56  
11 Q Can -- in order to deal with this, if you 06:50:56  
12 could -- if you have access to the RAMCO phase 1 06:50:59  
13 report, you can just look it up. We can -- we can 06:51:05  
14 go with that, and then it will be marked later. 06:51:07  
15 A I actually do, sir. 06:51:10  
16 Q Great. 06:51:18  
17 A Is that okay with everyone? 06:51:24  
18 MR. HAGSTROM: Okay with me. 06:51:28  
19 MR. GEE: Yeah, I'm good. 06:51:29  
20 BY MR. SINCLAIR:  
21 Q Mr. Hokkanen, have you ever performed a 06:51:36  
22 phase 1 investigation before? 06:51:39  
23 A Yes. 06:51:46  
24 Q Does your -- does your CV say anything 06:51:46  
25 about your experience in having prepared phase 1 06:51:51

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1 investigations? 06:51:55

2 A Yes, it does. 06:51:56

3 Q And can you point me to where in your CV 06:51:57

4 there's information regarding that? Rather than 06:52:07

5 sending you on a wild goose chase, you can correct 06:52:19

6 me if I'm wrong, if I've really missed something, 06:52:23

7 but I found two references to phase 1s. I found one 06:52:27

8 reference at -- it's in your detailed CV toward -- 06:52:35

9 toward the end of -- I think it would be -- 06:52:49

10 A Yes, I found it, sir. 06:52:54

11 Q Okay. On page 99, it's regarding phase 1 06:52:55

12 and phase 2 environmental assessment manufacturing 06:53:05

13 facility Bakersfield, and then there's another 06:53:09

14 reference a couple pages later on page 103 of the 06:53:16

15 PDF, phase 1 and 2 investigations, sports center, 06:53:23

16 Blaine, Minnesota, conducted a phase 1 and phase 2 06:53:30

17 investigation of a property. 06:53:33

18 Those are the only references to a phase 1 06:53:34

19 I have found in your expert report. 06:53:38

20 A I think that's all I included in the CV. 06:53:41

21 That's correct. I will tell you, Mr. Sinclair, I've 06:53:44

22 been in this business for 40 years. If I included 06:53:49

23 every cite that I ever worked on and collected data, 06:53:54

24 was a principal in charge, my CV would probably be 06:53:58

25 about 60, 70 pages. 06:54:02

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1 And so I have conducted more than these two 06:54:05  
2 phase 1s. I have been advising others on the 06:54:07  
3 conduction and the information and conclusions from 06:54:15  
4 phase 1 investigations, and I've been a principal 06:54:17  
5 reviewer on phase 1 documents. 06:54:20

6 Q But your CV doesn't say anything about 06:54:25  
7 experience in doing phase 1s, but that's all the 06:54:29  
8 more reason why I want to talk to you about it. 06:54:32

9 So you're saying you've done many? 06:54:36

10 A Yes, sir. 06:54:39

11 Q And how many would that be? How many would 06:54:39  
12 you estimate that -- how many phase 1s have you been 06:54:45  
13 involved in in your career? 06:54:49

14 A I haven't counted them up, but in various 06:54:51  
15 capacities, probably 30 or 40. 06:54:54

16 Q And in what capacity -- I'm more interested 06:54:56  
17 in soup to nuts really, so to speak. I mean how 06:55:06  
18 many phase 1s have you done from start to finish in 06:55:14  
19 terms of investigating, interviewing, and drafting 06:55:17  
20 the phase 1 from start to completion? 06:55:23

21 A I did quite a few in the -- in the late 06:55:25  
22 '80s into the '90s. I have never really counted up 06:55:34  
23 how many I actually did. I can make an educated 06:55:40  
24 guess. It might be above 20, 25, something like 06:55:43  
25 that. 06:55:47

1 Q Okay. And these two phase 1s I saw 06:56:02  
2 referenced in your CV, the one in Bakersfield, can 06:56:05  
3 you tell me -- can you tell me about that briefly? 06:56:12  
4 A This -- as I say in the CV, this was a -- 06:56:19  
5 this was a former manufacturing facility. There was 06:56:27  
6 a prospective buyer. I performed a phase 1 first, 06:56:30  
7 identified some recognized environmental conditions 06:56:38  
8 based on my findings, which led to -- as it does, to 06:56:43  
9 a phase 2 to investigate those recognized 06:56:47  
10 environmental conditions. 06:56:50  
11 Q Did you actually draft the phase 1 report 06:56:52  
12 in this matter? 06:56:55  
13 A I believe so, yes. 06:56:59  
14 Q And the other phase 1 at a site in 06:57:10  
15 Minnesota, sports center, Blaine, Minnesota 06:57:13  
16 conducted a phase 1 and a phase 2 of a property that 06:57:17  
17 was being acquired to expand this sports center 06:57:21  
18 facility. 06:57:24  
19 What was your involvement in that phase 1? 06:57:27  
20 A That was a few years ago. That was in the 06:57:32  
21 phase where I talked about in the -- probably in the 06:57:34  
22 late '80s into the '90s. This was done as part of 06:57:38  
23 my work back -- I was living in Minnesota at the 06:57:44  
24 time. 06:57:48  
25 And as it says, there is a large sports 06:57:48

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1 center in the suburb of Minneapolis, Blaine. They 06:57:53  
2 were looking to acquire some property to expand 06:57:56  
3 their facility. I would get a phase 1, identified 06:57:59  
4 some recognized environmental conditions, and then 06:58:03  
5 conduct a phase 2 based on those findings. 06:58:07  
6 Q And did you draft the phase 1 in that case? 06:58:14  
7 A Likely did, but that's normally what you do 06:58:19  
8 when you do a phase 1. 06:58:24  
9 Q You don't recall whether you actually 06:58:27  
10 prepared the phase 1 report? 06:58:32  
11 A Recall an actual report, about 25 years ago 06:58:35  
12 or so, no, but if I conducted a phase 1, I would 06:58:42  
13 have generated a report, sir. 06:58:46  
14 Q So I think you testified a few moments ago 06:58:48  
15 that you believe that you've prepared about 20 to 25 06:59:00  
16 phase 1s in your career? 06:59:05  
17 A That's an estimate. 06:59:08  
18 Q And -- and what did you say about phase 1 06:59:09  
19 reports that you've reviewed or been involved with? 06:59:15  
20 I can't remember what number you gave on that. 06:59:17  
21 A Quite frankly, these are educated guesses. 06:59:21  
22 I was with a firm called Farallon. Farallon did a 06:59:28  
23 lot of phase 1s, and I did a lot of assisting with 06:59:33  
24 those more senior review of the findings, and 06:59:37  
25 drawing the conclusions and then did principal 06:59:41

1 review of the report itself. 06:59:44

2 Q So how many would you estimate? 06:59:54

3 A I've worked there for about five years. 06:59:56

4 20, 25, I was involved in some capacity. They did 07:00:05

5 quite a few. I wasn't involved in all of them, but 07:00:09

6 I was involved in some of them. 07:00:14

7 Q Did you work with Steve Figgins at 07:00:16

8 Farallon? 07:00:21

9 A I worked with Steve, yes. 07:00:21

10 Q Yes. I worked with Steve when he was at 07:00:23

11 Farallon. He worked with me on a site a couple 07:00:28

12 years ago. 07:00:30

13 A We'll talk off the record about 07:00:31

14 Mr. Figgins. 07:00:34

15 Q He's a good guy. And I think he's working 07:00:39

16 in your current company, isn't he? 07:00:41

17 A Yes. 07:00:43

18 Q I saw his name on some of the billing. 07:00:44

19 A Yes. 07:00:46

20 Q Before this case, have you ever served as 07:00:53

21 an expert regarding compliance with ASTM standards? 07:00:56

22 A I don't know if that's come up. You've 07:01:07

23 seen my CV. I've testified quite a few times. 07:01:12

24 Q I kind of asked -- I'm sorry to interrupt 07:01:19

25 you. Go ahead. 07:01:22

1           A     I started testifying a long time ago. It 07:01:26  
2           may have come up before. I can't recall a specific 07:01:32  
3           case. I could go through those at some point and 07:01:35  
4           see. It has not been the focus of my expert work 07:01:38  
5           over the years. 07:01:42

6           Q     I kind of asked you a similar question 07:01:43  
7           before that in asking you if you had ever served as 07:01:49  
8           an expert regarding -- well, I asked you if you had 07:01:53  
9           ever served as an expert regarding the BFPP defense. 07:01:56

10                  This is a slightly different question, I 07:02:05  
11           guess and the question is a little bit like the one 07:02:11  
12           I asked a minute ago, and, that is, have you ever 07:02:14  
13           served as an expert regarding phase 1 reports in 07:02:17  
14           preparation of a phase 1 report or the adequacy of a 07:02:22  
15           phase 1 report? 07:02:26

16           A     I thought I just answered that one. 07:02:28  
17           Sitting here right now, I can't recall. It has not 07:02:33  
18           been the focus of my expert testimony since I've 07:02:37  
19           been doing this. 07:02:40

20           Q     Okay. Why did you refer -- or do you refer 07:02:44  
21           to the phase 1 report prepared by RAMCO as a PEA? 07:03:03

22           A     That was an abbreviation for preliminary 07:03:12  
23           environmental assessment. 07:03:16

24           Q     Do you understand that in California, PEA 07:03:20  
25           is not used commonly as an acronym for preliminary 07:03:23

1 environmental assessment? 07:03:32

2 A Well, I also understand that the term -- 07:03:34

3 the phase "preliminary environmental site 07:03:39

4 assessment" is also not commonly used. We generally 07:03:42

5 call these phase 1 site assessments. As a matter of 07:03:46

6 fact, the phrase preliminary site assessment is 07:03:51

7 actually not in the ASTM standard. 07:03:54

8 Q Do you know what -- do you know what a 07:04:02

9 preliminary endangerment assessment is? 07:04:05

10 A I do and -- 07:04:07

11 THE REPORTER: I'm sorry. I'm sorry. 07:04:08

12 Preliminary what? 07:04:10

13 MR. SINCLAIR: Preliminary endangerment 07:04:13

14 assessment. 07:04:14

15 THE WITNESS: Yes, I do. I've reviewed 07:04:16

16 them and I did not refer to or use the word 07:04:22

17 "endangerment" in my expert or my rebuttal report. 07:04:26

18 PEA was simply an abbreviation, as is indicated in 07:04:33

19 the text, for preliminary environmental assessment. 07:04:36

20 BY MR. SINCLAIR: 07:04:46

21 Q Can you tell me generally what a bona fide 07:04:46

22 prospective purchaser is under CERCLA? 07:04:49

23 A Basically what it is is a party that is 07:04:56

24 acquiring a property, and it is a process to first 07:05:00

25 confirm that you aren't contributing contamination 07:05:05

1 to the property, which is generally the reason you 07:05:10  
2 do a phase 1. 07:05:13  
3 You establish what contamination is there 07:05:14  
4 and recognized environmental condition as either an 07:05:17  
5 actual or potential contamination, and then there 07:05:23  
6 are certain requirements that one needs to follow 07:05:27  
7 after you acquire the property. 07:05:32  
8 Q All right. We'll talk specifically about 07:05:37  
9 your opinions. You've done essentially three 07:05:40  
10 statements of your opinion regarding the BFPP 07:05:48  
11 defense. 07:05:53  
12 You've done an expert report. You did an 07:05:54  
13 expert rebuttal report and a declaration setting 07:05:59  
14 forth your opinion that was just filed in this case 07:06:04  
15 yesterday in court. 07:06:07  
16 Are you aware of your declaration having 07:06:08  
17 been filed yesterday? 07:06:14  
18 A Yes. 07:06:22  
19 Q Can you tell me what are the differences 07:06:22  
20 between these three documents? Are they all 07:06:29  
21 essentially the same in terms of setting forth your 07:06:33  
22 opinion because honestly -- basically -- 07:06:36  
23 A Yeah. 07:06:43  
24 Q That's what I thought. I would prefer not 07:06:44  
25 to talk to you about each one of them. And in doing 07:06:50

1 a side by side, they appear quite similar; is that 07:06:53  
2 correct? 07:07:01  
3 A They are similar. 07:07:02  
4 Q Did you say anything in the rebuttal report 07:07:03  
5 in terms of setting forth your basic opinion on the 07:07:11  
6 defense that you don't say in the official expert 07:07:16  
7 report? 07:07:19  
8 A I don't believe so. The basic opinions are 07:07:22  
9 essentially the same. 07:07:25  
10 Q Did you read the motion for good-faith 07:07:29  
11 settlement that SIC filed in the litigation before 07:07:38  
12 you wrote your declaration? 07:07:43  
13 A Remember, it's been quite a while. I may 07:07:51  
14 have been given that and read that, yes, I believe I 07:07:54  
15 might have. 07:07:57  
16 Q You're not certain you read the motion, 07:07:58  
17 though? 07:08:03  
18 A I think I did. If I did, I probably read 07:08:04  
19 it once, but I'm remembering that I did read that 07:08:07  
20 motion, yes. 07:08:13  
21 Q Yeah. I think one reason why it might be a 07:08:14  
22 little confusing is that I saw your billing in the 07:08:20  
23 case and a great deal of your billing is related to 07:08:23  
24 the preparation of a declaration to oppose SIC's 07:08:26  
25 summary judgment motion. 07:08:32

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1 So there are two different motions in play. 07:08:33

2 The summary judgment motion was filed by SIC and 07:08:37

3 then SIC settled. So I think that what you say with 07:08:40

4 regard to the BFPP defense might be similar with 07:08:48

5 respect to both of them; correct or wrong? 07:08:52

6 A I think so. 07:08:58

7 Q Okay. Would I be correct in saying that 07:08:58

8 your opinion that SIC is not entitled to assert the 07:09:07

9 BFPP defense is set forth in four reasons, if we 07:09:12

10 look at page 58 of your expert report? 07:09:19

11 THE VIDEOGRAPHER: Counsel, sorry to 07:09:41

12 interrupt. I just wanted to let you know, we're at 07:09:42

13 about eight hours now. 07:09:43

14 MR. SINCLAIR: Thank you. 07:09:47

15 THE WITNESS: I'm there, sir, and the 07:09:50

16 answer is, yes, there were four of the criteria that 07:09:52

17 I opined on that were not met. 07:09:56

18 BY MR. SINCLAIR: 07:10:02

19 Q Okay. Let's go through the four reasons. 07:10:02

20 What is the first reason? 07:10:09

21 A The first reason had to do with disposal of 07:10:15

22 hazardous substances after SIC acquired the 07:10:21

23 property. 07:10:25

24 Q Okay. And did you find any evidence that a 07:10:37

25 hazardous release occurred when demolition and 07:10:39

1 removal activities were performed at the SIC site? 07:10:41

2 A Not specific documentation, no. I read the 07:10:48

3 information that was available. There was not 07:10:51

4 information available above the actual deposition 07:10:57

5 itself. There wasn't a report about that. 07:11:00

6 There was a report about the sump removals 07:11:03

7 and what was done with the wastewater. And then I 07:11:07

8 also reviewed manifests that were generated from 07:11:12

9 the -- from the activities after acquiring the 07:11:15

10 property. 07:11:20

11 Q Does the removal of the hazardous 07:11:24

12 substances from the site necessarily mean that a 07:11:26

13 disposal occurred? 07:11:28

14 A Is removal, no. 07:11:30

15 Q I think you make quite a bit out of the 07:11:31

16 statement that the chemical tanks weren't empty when 07:11:47

17 the phase 1 site visit occurred in September 2003. 07:11:50

18 How can you be certain that the tanks 07:12:02

19 weren't empty at that time? 07:12:04

20 A That's based on my review of the manifests 07:12:07

21 and the manifest indicated that material from the 07:12:11

22 tanks were removed off-site. 07:12:15

23 Q There was a later inspection that occurred 07:12:25

24 at the site probably four to six months later, 07:12:30

25 and -- anyway strike that question. 07:12:32



1 At page 60 of your report, you say that you 07:12:43  
2 have 40 years of experience working on industrial 07:12:47  
3 properties. 07:12:49

4 How many sites have you been involved with 07:12:53  
5 where a factory was decommissioned? 07:12:56

6 A Well, there have been quite a number of 07:13:02  
7 sites, not a factory -- well, there have been a 07:13:05  
8 couple of those where parts or tanks are removed. 07:13:12  
9 I've seen sumps removed, underground piping removed, 07:13:15  
10 and also seen quite a number of sites after removal 07:13:22  
11 activities have happened. 07:13:29

12 Q So in this paragraph on page 60, you're 07:13:41  
13 basically saying that because of your extensive 07:13:45  
14 experience, there must have been some hazardous 07:13:51  
15 release of disposal because equipment was 07:13:55  
16 dismantled, sumps were removed, and the site was 07:14:01  
17 decommissioned as a manufacturing facility, 07:14:08  
18 something must have happened; is that -- is that 07:14:11  
19 correct? 07:14:17

20 A Yes. 07:14:17

21 Q But you have no -- you have no evidence 07:14:18  
22 that anything happened, do you? 07:14:20

23 A I don't have specific documentation, no. 07:14:22

24 Q Okay. Let's go on to the second reason. 07:14:25

25 You say that SIC failed to meet -- to conduct all 07:14:51

1 appropriate inquiries made in compliance with 07:14:57  
2 accepted good commercial practices. 07:15:01  
3 Now, this is interesting. You say that -- 07:15:10  
4 you say RAMCO failed to conduct a site 07:15:16  
5 reconnaissance according to the ASTM standard at the 07:15:22  
6 bottom of page 60 of -- of your report. And then 07:15:25  
7 continuing onto page 61, there are 13 requirements, 07:15:36  
8 and you say that based on section 5.0 of the RAMCO 07:15:45  
9 phase 1, information from site 07:15:54  
10 reconnaissance/interviews, not a single one of these 07:15:59  
11 13 requirements were met by RAMCO. 07:16:02  
12 And I want to ask you, did you actually 07:16:12  
13 read the RAMCO phase 1? 07:16:14  
14 A Several times, yes. 07:16:17  
15 Q Okay. Well, let's -- let's look at the 07:16:19  
16 RAMCO phase 1 with regard to these requirements. So 07:16:23  
17 first one is observation of the interior of 07:16:33  
18 structures. 07:16:37  
19 If you can look at page 16 of the RAMCO 07:16:49  
20 phase 1, I've seen more eloquent statements of the 07:16:52  
21 description of an interior of a building, but there 07:17:06  
22 is a section in the middle of the page on page 16 07:17:09  
23 entitled "Interior" that describes the interior of 07:17:13  
24 the building. 07:17:20  
25 Is it your opinion that does not comply 07:17:25

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1 with the site reconnaissance requirement? 07:17:27

2 A Well, you asked me earlier about how much 07:17:35

3 phase 1 work that I've done. I've done quite a few 07:17:38

4 site reconnaissance myself, and what you're looking 07:17:43

5 for and what you need to report on, the purpose of 07:17:49

6 doing a site reconnaissance, as clearly stated in 07:17:52

7 the ASTM standard, is to attempt to identify the 07:17:58

8 presence or absence recognized in the environmental 07:18:04

9 conditions.

10 THE REPORTER: Earl, can you mute, please? 07:18:08

11 THE WITNESS: So what you're doing is 07:18:10

12 you're looking for staining on the floor. You're 07:18:11

13 looking for where chemicals may or may not have been 07:18:14

14 stored, drains in the floor, any -- any type of 07:18:17

15 indication that there might be releases of hazardous 07:18:23

16 substances. 07:18:27

17 And this short two-sentence description of 07:18:28

18 their extensive survey of the interior of, I don't 07:18:32

19 know, how many buildings are on the facility, I 07:18:38

20 don't see any indication that they were trying to 07:18:39

21 identify recognized environmental conditions. 07:18:42

22 THE REPORTER: Earl, can you mute, please? 07:18:45

23 MR. HAGSTROM: Sorry. 07:18:48

24 THE REPORTER: Thank you. 07:18:49

25 THE WITNESS: Furnishings generally don't 07:18:50

1 lead to recognized environmental conditions as an 07:18:53  
2 example.

3 BY MR. SINCLAIR:

4 Q Okay. The second one B is the approximate 07:18:55  
5 quantities, present and past, of hazardous 07:19:00  
6 substances and petroleum products used at the 07:19:02  
7 property, types of containers, and storage 07:19:06  
8 conditions. 07:19:10

9 Well, if you look at pages 16 and 17, 07:19:12  
10 sections 5.3 to 5.5, I don't want to read all of 07:19:16  
11 that to you, but this -- this language here, these 07:19:25  
12 sections, describe -- they identify all the 07:19:34  
13 hazardous substances used by the company, which are 07:19:38  
14 no longer there, they describe how the solutions 07:19:42  
15 were stored. 07:19:47

16 In 5.4, they specifically mention and 07:19:52  
17 discuss tanks, runoff sumps, the fact that in 5.5, 07:19:59  
18 that underground storage tanks were no longer 07:20:11  
19 present, that above-ground storage tanks have been 07:20:14  
20 abandoned. I don't know how you can say that not a 07:20:21  
21 single one these 13 requirements were met. I have 07:20:31  
22 to look through --

23 A Well, let's go back through -- 07:20:35

24 MR. HAGSTROM: Is there actually a question 07:20:37  
25 in there? 07:20:39

1 BY MR. SINCLAIR: 07:20:48

2 Q How can you say that none of the 07:20:48

3 requirements were met? 07:20:50

4 A Let's go back to B. I think that's what 07:20:53

5 we're working on, right? 07:20:55

6 Q Right. 07:20:56

7 A The first part of the ASTM standard that I 07:20:57

8 list for site reconnaissance in B is the approximate 07:21:01

9 quantities, present and past, of hazardous 07:21:05

10 substances and petroleum products used at the 07:21:08

11 property. I don't see that in their phase 1 07:21:11

12 document. 07:21:13

13 Second part of B is types of containers and 07:21:24

14 storage conditions, and storage conditions in a site 07:21:27

15 reconnaissance is extremely important. Again, the 07:21:29

16 purpose of doing a site reconnaissance is try to 07:21:33

17 identify if hazardous substances have been released 07:21:37

18 at the site, in other words, are there recognized 07:21:41

19 environmental conditions. 07:21:44

20 There's no mention of the condition of the 07:21:46

21 storage -- underground storage tanks, where they 07:21:50

22 work, how big they were, what was actually stored in 07:21:53

23 each one, what the condition of the tanks were. 07:21:56

24 There's no one -- this is the information you use to 07:21:59

25 try to identify releases, i.e., recognized 07:22:02

1 environmental conditions. 07:22:06

2 Q But don't you think you have to give some 07:22:08

3 consideration to the fact that this was no longer an 07:22:11

4 active factory, that it was in the process of being 07:22:15

5 decommissioned when this phase 1 occurred? 07:22:18

6 A Let me go -- let me answer that by saying 07:22:24

7 this. The primary purpose of conducting a phase 1 07:22:27

8 is to establish in this case or a potential to 07:22:34

9 establish what impact, what contamination may 07:22:37

10 actually or may be present at a site. 07:22:43

11 You need to establish that so you don't 07:22:45

12 take liability for contamination at a site. You 07:22:49

13 establish you a baseline, and so identifying what 07:22:52

14 happened in the past is just as important as what's 07:22:58

15 there right now. 07:23:01

16 So trying to identify where the tanks were, 07:23:05

17 what they held, what condition -- when were they 07:23:08

18 taken out, what condition they were in, for example, 07:23:11

19 all of that information is extremely important to 07:23:11

20 identify if releases from those underground storage 07:23:16

21 tanks occurred. 07:23:20

22 If you find contamination where those 07:23:24

23 storage tanks were later and you don't mention that 07:23:25

24 in your phase 1, you could take liability for that. 07:23:28

25 We can go to the next one, C. 07:23:38

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1 Q Identification of above-ground storage 07:23:49  
2 tanks, underground storage tanks, vent pipes, fuel 07:23:51  
3 pipes, etcetera. 07:23:56  
4 A Then in parenthesis, it says --  
5 Q Again, look at page 17, section 5.5, there 07:24:04  
6 are currently no underground storage tanks on the 07:24:09  
7 site. USTs were -- and then it proceeds to describe 07:24:13  
8 the past history -- USTs were used in the past for 07:24:18  
9 fuel, but have been removed. Above-ground liquid 07:24:23  
10 storage tanks in the processing area have been 07:24:27  
11 abandoned and will be removed in the future. 07:24:31  
12 How does that not comply? 07:24:38  
13 A Well, if we go back to C, the part you left 07:24:42  
14 out when you read that was, content, capacity, and 07:24:45  
15 age, again, identifying very specifically how many 07:24:50  
16 storage tanks were there, where were they, what did 07:24:55  
17 they contain, what was the capacity, how old were 07:24:58  
18 they, all of that information again is very 07:25:02  
19 important in a site reconnaissance to try to 07:25:05  
20 identify if there's recognized environmental 07:25:10  
21 conditions which is the purpose of doing the phase 07:25:14  
22 1. 07:25:17  
23 Q And you believe -- 07:25:17  
24 A I don't see that in that section. 07:25:19  
25 Q And you believe it's incumbent upon someone 07:25:21

1 doing a phase 1 to describe in detail underground 07:25:26  
2 storage tanks which are no longer present on the 07:25:30  
3 site -- 07:25:33  
4 A Yes. 07:25:33  
5 Q -- and the condition of the tanks? 07:25:34  
6 A Again, I described this before. The 07:25:37  
7 primary purpose of a phase 1 is to establish the 07:25:41  
8 best you can what contamination is present at a site 07:25:45  
9 so you don't take liability for it when it's 07:25:49  
10 discovered later. 07:25:53  
11 So underground storage tanks -- and I've 07:25:54  
12 done a lot of work on underground storage tanks -- 07:25:57  
13 underground storage tanks have created a great deal 07:26:00  
14 of contamination of soil and groundwater, steel 07:26:05  
15 tanks in the ground leak, especially old steel 07:26:08  
16 tanks. 07:26:11  
17 And so identifying where the tanks were, 07:26:11  
18 how old they were, what they contain, what condition 07:26:18  
19 they were in, yes, that's all extremely important 07:26:20  
20 information. 07:26:23  
21 Q How did you reach the conclusion that the 07:26:37  
22 RAMCO phase 1 did not identify any recognized 07:26:39  
23 environmental condition where there was impact on 07:26:43  
24 the property? 07:26:46  
25 A Well, I don't -- again, I read that phase 1 07:26:50



1 report and I didn't see any reference or listing of 07:26:57  
2 recognized environmental conditions. If you could 07:27:01  
3 point me to the section that's in, I would be more 07:27:06  
4 than happy to take a look. 07:27:08

5 Q Why don't we back up. Why don't you tell 07:27:22  
6 me what you think a recognized environmental 07:27:24  
7 condition is. 07:27:27

8 A It's actually -- why don't we just use the 07:27:29  
9 definition of -- in the ASTM standard. How about 07:27:32  
10 that? 07:27:35

11 Q Fine. 07:27:36

12 A In my expert report, page 60, the term 07:27:44  
13 "recognized environmental condition" is defined as 07:27:48  
14 the presence or likely presence of any hazardous 07:27:51  
15 substances, I think I say, or petroleum products on 07:27:54  
16 a property under conditions that indicate existing 07:27:59  
17 release, a past release, or material threat of a 07:28:02  
18 release of any hazardous substances in petroleum in 07:28:07  
19 the structures on the property or into ground, 07:28:11  
20 groundwater, or surface water of the property. 07:28:13

21 So, again, what you're -- recognized 07:28:16  
22 environmental condition, you're looking at the 07:28:19  
23 actual or potential releases of hazardous substances 07:28:23  
24 that could cause soil and groundwater contamination. 07:28:29

25 Q Let me direct your attention to the last 07:28:33

1 two paragraphs on page 1, section 1 of the executive 07:28:38  
2 summary. 07:28:44  
3 MR. HAGSTROM: Of Gary's report? 07:28:52  
4 THE WITNESS: No, of the phase 1. 07:28:54  
5 MR. SINCLAIR: Of the phase 1 report, of 07:28:56  
6 the phase 1 report. 07:28:59  
7 MR. HAGSTROM: Thank you. 07:29:00  
8 BY MR. SINCLAIR: 07:29:14  
9 Q So after reading those two paragraphs, I'd 07:29:14  
10 like you to look at those two paragraphs and also 07:29:24  
11 look at -- look at section 6.5 at the end of the 07:29:29  
12 report. 07:30:01  
13 A Okay. 07:30:15  
14 Q All right. And after reading those 07:30:16  
15 paragraphs, is it still your opinion that the RAMCO 07:30:19  
16 phase 1 did not identify any recognized 07:30:31  
17 environmental conditions? 07:30:34  
18 A Well, 6.5 are recommendations, and I don't 07:30:39  
19 see any identification of recognized environmental 07:30:46  
20 conditions. And in the executive summary, I did not 07:30:53  
21 also see any listing of any recognized environmental 07:30:57  
22 conditions. 07:31:05  
23 And so the answer is they're not here. 07:31:06  
24 There's a general statement that, hey, there's 07:31:10  
25 contamination at the site which is pretty well 07:31:12

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1 established by the time this phase 1 was done, and 07:31:15  
2 we're talking about did the phase 1 meet the 07:31:22  
3 standard that ASTM established. 07:31:25

4 ASTM specifically says in the conclusions 07:31:29  
5 of a phase 1, you need to either do one of two 07:31:35  
6 things. You need to say there's recognized 07:31:37  
7 environmental conditions and list them or you need 07:31:41  
8 to say we didn't identify any recognized 07:31:45  
9 environmental conditions. 07:31:49

10 That's a requirement of the ASTM standard 07:31:50  
11 and it's the very purpose of conducting all this 07:31:53  
12 work and doing a phase 1. That's not in this 07:31:56  
13 document. 07:32:00

14 Q But going back to the definition we're 07:32:03  
15 using in the ASTM standard, you say, it's defined as 07:32:05  
16 the presence or likely presence of any hazardous 07:32:13  
17 substances indicating an existing release, a past 07:32:17  
18 release, or the material threat of a release of any 07:32:24  
19 hazardous substance. 07:32:27

20 So you may not like how it's worded, but to 07:32:29  
21 simply say that there's contamination and further 07:32:35  
22 investigation of the site soil and groundwater, it 07:32:39  
23 is recommended, doesn't that comply with the ASTM 07:32:42  
24 standard? 07:32:48

25 MR. HAGSTROM: Objection. It's 07:32:49

1 argumentative. 07:32:50

2 Go ahead, Mr. Hokkanen. 07:32:54

3 THE WITNESS: The answer was no. 07:32:57

4 BY MR. SINCLAIR: 07:33:01

5 Q And why? 07:33:01

6 A Again, if we could pull out the ASTM 07:33:07

7 standard itself, and I'll tell you what it says, it 07:33:11

8 says that you need to identify actual or potential 07:33:15

9 releases of hazardous substances and list those. 07:33:21

10 Now, let me give you an example. Based on 07:33:25

11 what they said here, they basically say there's some 07:33:28

12 contamination here, we need to do investigation, 07:33:32

13 correct? 07:33:37

14 THE REPORTER: I'm sorry. What is that 07:33:40

15 noise? 07:33:40

16 THE VIDEOGRAPHER: Mr. Hokkanen, for some 07:33:40

17 reason, your -- your audio got really buzzy just 07:33:44

18 recently. 07:33:48

19 THE WITNESS: Section 6.5, for example, 07:33:49

20 says is that there's contamination at the site -- 07:33:52

21 can you hear? 07:33:59

22 THE REPORTER: You don't hear it? Do you 07:34:02

23 guys hear it? 07:34:03

24 THE WITNESS: Sorry. I can hear you. 07:34:06

25 MR. SINCLAIR: I hear it. I'm wondering 07:34:06

1           whether it's coming from my computer because of the           07:34:07  
2           download. I just closed the attempted download.           07:34:11  
3           THE WITNESS: Earl is on mute right now.           07:34:15  
4           Is that the issue?           07:34:20  
5           MR. HAGSTROM: The only time I'm hearing           07:34:20  
6           that buzzing sound is when Mr. Hokkanen speaks.           07:34:25  
7           THE WITNESS: Can you hear me now as the           07:34:28  
8           commercial says?           07:34:30  
9           MR. SINCLAIR: I can hear you, but there's           07:34:32  
10          a -- there's a buzzing.           07:34:33  
11          THE VIDEOGRAPHER: It just started. Is it           07:34:39  
12          possibly -- oh, you're not wired anyway. I was           07:34:41  
13          thinking maybe a loose wire.           07:34:45  
14          MR. SINCLAIR: It went away.           07:34:49  
15          THE WITNESS: Okay.  
16          MR. SINCLAIR: Well, no, when you talk,           07:34:51  
17          it's --           07:34:53  
18          THE VIDEOGRAPHER: Every time you speak,           07:34:53  
19          it's there.           07:34:54  
20          THE REPORTER: Do you want to go off the           07:34:57  
21          record or --           07:35:01  
22          MR. SINCLAIR: Do you have a           07:35:01  
23          recommendation?           07:35:01  
24          THE VIDEOGRAPHER: Would you like to go off           07:35:02  
25          the record?           07:35:03

1 MR. GEE: Yeah, let's go off the record 07:35:03  
2 because we're running out of time. 07:35:05  
3 THE VIDEOGRAPHER: Thank you. We're going 07:35:06  
4 off the record at 7:34. 07:35:08  
5 (Recess taken.)  
6 THE VIDEOGRAPHER: We are back on the 07:39:51  
7 record. The time is 7:39. Please proceed. 07:39:52  
8 BY MR. SINCLAIR: 07:39:57  
9 Q Mr. Hokkanen, we talked about recognizing 07:39:57  
10 environmental conditions. You contend that the 07:40:03  
11 RAMCO phase 1 did not recognize environmental 07:40:09  
12 conditions. 07:40:12  
13 I have further questions along those lines, 07:40:12  
14 and, that is, isn't it possible for a phase 1 to 07:40:14  
15 still be compliant even if it does not identify 07:40:18  
16 recognized environmental conditions in connection 07:40:23  
17 with the property? 07:40:26  
18 A Let me clarify your question. What the 07:40:31  
19 ASTM standard says is that you don't need to 07:40:34  
20 identify a recognized environmental condition and if 07:40:39  
21 you don't, you need to state that. 07:40:44  
22 Q What evidence do you have that any 07:40:53  
23 purported delay by SIC caused continuing releases of 07:40:57  
24 hazardous substances at the site? 07:41:02  
25 A What evidence do I have? 07:41:05

1 Q Yes. 07:41:07

2 A Well, that is based on soil contamination 07:41:07

3 that was identified at the site, infiltrating -- 07:41:17

4 infiltrating rainwater moving through the soil 07:41:23

5 contamination and working its way down to the water 07:41:27

6 table. 07:41:30

7 Q At page 62 of your report, you state the 07:41:40

8 photos taken of a rainfall event in February 2005 -- 07:41:43

9 this is at page 62 of your report. 07:41:49

10 A Yes. 07:41:52

11 Q You state that these photos taken of a 07:41:53

12 rainfall event in February 2005 show conditions 07:41:57

13 "that would lead to infiltration of water into the 07:42:06

14 ground." 07:42:07

15 Do you know whether this water reached 07:42:15

16 groundwater? 07:42:18

17 A Some of it would infiltrate into the ground 07:42:22

18 because those photographs that you reference show 07:42:26

19 bare ground and, yes, based on my experience as a 07:42:29

20 hydrogeologist, eventually that water would reach 07:42:33

21 the groundwater, yes. 07:42:37

22 Q And do you know for a fact that this water 07:42:38

23 contained hazardous substances? 07:42:41

24 A I am forming that opinion based on the 07:42:49

25 presence of contaminated soil under the site. I 07:42:51

1 mean the photographs, for example, show the former 07:42:55  
2 wastewater pond area that received contamination as 07:42:59  
3 an example -- and I'm sorry. Could you repeat the 07:43:03  
4 question? I lost my train of thought, sir. It's 07:43:09  
5 late in the day. 07:43:11

6 MR. SINCLAIR: Linda, could you read it 07:43:14  
7 back, please. 07:43:15

8 (The record was read as follows:

9 "Q And do you know for a fact  
10 that this water contained hazardous  
11 substances?")

12 THE WITNESS: Okay. So what -- what I know 07:43:29  
13 from my training and experience is that infiltrating 07:43:31  
14 water in contact with soil that contains VOC, for 07:43:35  
15 example, will leach some of those VOCs and then 07:43:42  
16 migrate downward to the water table. 07:43:45

17 BY MR. SINCLAIR: 07:43:53

18 Q Okay. So is that speculation or an 07:43:53  
19 opinion? 07:43:58

20 A It's not speculation. That's based on the 07:43:58  
21 science of movement of water through the unsaturated 07:44:01  
22 zone contacting contaminants, dissolving those VOCs 07:44:08  
23 in this case, and moving down to the water table. 07:44:14

24 I don't believe samples of water in the 07:44:16  
25 vadose zone had been collected at the site. That 07:44:20



1 opinion is based on my pretty extensive experience 07:44:24  
2 with situations like this. 07:44:27  
3 Q How did you reach the opinion on page 62 07:44:30  
4 that SIC delayed for 12 years addressing to -- to 07:44:36  
5 address the leaching of hazardous substances at the 07:44:45  
6 site? How did you -- how did you arrive at the 07:44:51  
7 12-year figure? 07:44:54  
8 A Where on 62 is that, sir? There it is. At 07:44:55  
9 the bottom of the -- 07:45:00  
10 Q Second to the last paragraph. 07:45:00  
11 A Yes, I believe that was the time until they 07:45:07  
12 started remediation at the site if I'm remembering 07:45:12  
13 correctly. 07:45:17  
14 Q Do you consider soil vapor extraction to be 07:45:30  
15 remediation? 07:45:35  
16 A Yes. 07:45:41  
17 Q Did you look at -- did you look at the 07:45:41  
18 EnviroStor website in terms of all the things that 07:45:50  
19 SIC has done at the site over the years? 07:45:54  
20 A Yes, I did, yes. 07:45:56  
21 Q All right. Were you aware of the fact 07:46:00  
22 that -- that RAMCO -- RAMCO produced an executed SVE 07:46:11  
23 pilot study in 2009-2010 at the site? 07:46:18  
24 A I do remember that, yes. 07:46:27  
25 Q So if that is correct, it certainly 07:46:28

1 wouldn't be 12 years, would it? 07:46:36

2 A Well, a pilot test doesn't cover an entire 07:46:39

3 site. It's a small little portion of the site to 07:46:44

4 determine if a particular remediation approach is 07:46:46

5 going to work or not. 07:46:51

6 And so a pilot test wouldn't -- it would 07:46:52

7 temporarily address a portion of the site, typically 07:46:54

8 a pretty small portion, but not the entire site. 07:46:57

9 They used the information they gather from the pilot 07:47:02

10 test to build out the entire system that covers the 07:47:05

11 entire problem on this site. 07:47:09

12 MR. SINCLAIR: Right. I know that we're 07:47:12

13 running out of time. So I'm going to give the floor 07:47:27

14 back to Byron to see if he can finish up. 07:47:34

15 I do have other questions, but -- 07:47:39

16 MR. GEE: Murray, why don't you ask your 07:47:41

17 other questions because I'm going to make a record 07:47:42

18 that, you know, Mr. Hokkanen has nine opinions. 07:47:46

19 Nine hours is not enough time to cover his opinions. 07:47:49

20 No offense, Mr. Hokkanen, but you did -- 07:47:53

21 you do have a pretty long report. So if you want to 07:47:56

22 finish up your section, then we'll take this up with 07:47:58

23 Mr. Hagstrom and Whittaker counsel at a later time. 07:48:04

24 MR. HAGSTROM: Right now you should know, 07:48:08

25 Byron, that when nine hours are up, we're done. 07:48:13

1 MR. GEE: I understand your position, 07:48:17  
2 Mr. Hagstrom, and I say we're going to make a record 07:48:19  
3 of nine hours not being long enough, and we'll take 07:48:25  
4 it up later. 07:48:28  
5 MR. HAGSTROM: We'll talk to the judge. 07:48:29  
6 Okay. Let's go. 07:48:30  
7 BY MR. SINCLAIR: 07:48:36  
8 Q All right. Well, let's talk about the 07:48:36  
9 fourth reason that you believe that SIC does not 07:48:38  
10 qualify as a BFPP. What was -- what was that 07:48:44  
11 reason? 07:48:51  
12 A Well, the requirement is to essentially 07:48:57  
13 follow the -- whatever government agency is 07:48:59  
14 overseeing the site, follow their requests and that 07:49:02  
15 sort of thing. I don't have the exact language in 07:49:08  
16 front of me, but that's the essence. 07:49:14  
17 Q Right. And why is it that -- well, is it 07:49:18  
18 your opinion that SIC did not follow government 07:49:25  
19 directives adequately? 07:49:30  
20 A Well, I mentioned one part in the process 07:49:34  
21 where the DTSC was ready to basically back out of 07:49:38  
22 the VCA for the site because they were not satisfied 07:49:44  
23 with the work that was being done at the site, and 07:49:48  
24 that's the basis of that opinion. 07:49:51  
25 Q Okay. But obviously that did not occur? 07:49:54

1 DTSC did not back out of the VCA; isn't that 07:49:59  
2 correct? 07:50:09  
3 A That is correct. 07:50:09  
4 Q Okay. And are you aware of the fact that 07:50:10  
5 DTSC has been very satisfied with SIC's effort in 07:50:18  
6 recent years? 07:50:24  
7 MR. HAGSTROM: Object; calls for -- hang 07:50:26  
8 on -- calls for speculation. 07:50:29  
9 THE WITNESS: I've read -- 07:50:39  
10 MR. HAGSTROM: Actually I will withdraw 07:50:40  
11 that. Sorry. No objection. 07:50:42  
12 THE WITNESS: Mr. Sinclair, I have read 07:50:44  
13 some of the recent correspondence, and what DTSC, 07:50:47  
14 again to really paraphrase, is that they are 07:50:53  
15 satisfied with the remediation efforts that are 07:50:56  
16 being conducted at the SIC site. 07:51:01  
17 BY MR. SINCLAIR: 07:51:04  
18 Q Thank you. You -- I'm thanking you because 07:51:04  
19 it eliminates a number of my other questions. 07:51:08  
20 Isn't it -- isn't the current status more 07:51:13  
21 important than what occurred nearly ten years ago? 07:51:18  
22 A More important in what way, sir? 07:51:22  
23 Q In terms of showing -- in terms of showing 07:51:25  
24 compliance as a BFPP. 07:51:32  
25 A Well, they -- they've been working on the 07:51:35

1 site for quite a long time, and there have been 07:51:39  
2 times where they are very satisfied, and this time I 07:51:44  
3 cite here that they were not satisfied. 07:51:48

4 And as I testified, based on the 07:51:50  
5 correspondence that I've looked at, they're 07:51:53  
6 satisfied with the remediation efforts that have 07:51:57  
7 been and are being conducted at the site. 07:52:01

8 MR. SINCLAIR: I have no further questions, 07:52:05  
9 sir. Thank you very much. 07:52:06

10 MR. GEE: Can we go off the record? Linda, 07:52:13  
11 how much time do we have or I guess -- - 07:52:16

12 THE VIDEOGRAPHER: We are going off the 07:52:17  
13 record at 7:52. 07:52:18

14 (Brief break.) 07:53:30

15 THE VIDEOGRAPHER: We are back on the 07:53:30  
16 record. The time is 7:53. Please proceed. 07:53:37

17

18 FURTHER EXAMINATION

19 BY MR. GEE:

20 Q Okay. Mr. Hokkanen, I'm going to try to 07:53:40  
21 move through some questions pretty quick. In 07:53:42  
22 opinion number eight, sir, you identify a number of 07:53:46  
23 different sites that you indicate that you, Santa 07:53:49  
24 Clarita Valley Water Agency, should have considered 07:53:56  
25 in their evaluation of the VOC -- potential VOC 07:53:57

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1 sites; is that correct? 07:54:00

2 A Yes. 07:54:01

3 Q And on these sites, did you make any 07:54:01

4 recommendations to Whittaker that they should add 07:54:06

5 any of these parties as a third-party defendant in 07:54:09

6 this current litigation? 07:54:12

7 A No. 07:54:14

8 Q And why not? 07:54:15

9 THE REPORTER: Earl, can you mute, please? 07:54:17

10 Sorry. Thank you. 07:54:21

11 THE WITNESS: Why didn't I? That's really 07:54:23

12 not my role in the process, sir. 07:54:25

13 BY MR. GEE: 07:54:27

14 Q Okay. Mr. Hokkanen, when you decide -- 07:54:27

15 when -- you're a consultant that has done PRP 07:54:30

16 studies in the past; is that right? 07:54:34

17 A Quite a few, sir. 07:54:36

18 Q Okay. In doing a PRP study, isn't there a 07:54:37

19 multistep process that you go through to determine 07:54:41

20 whether or not you have a viable case against PRP? 07:54:44

21 MR. HAGSTROM: Calls for a legal 07:54:48

22 conclusion. 07:54:50

23 THE WITNESS: I mean what I do is I look at 07:54:53

24 site data and identify if there are releases, and, 07:54:56

25 you know, that's -- as a consultant, that's -- 07:54:59

1 that's not really my role. 07:55:02

2 BY MR. GEE: 07:55:04

3 Q Okay. But don't you go through a process, 07:55:04

4 for example, you go through the EDR report. You 07:55:06

5 identify if a site uses a chemical, whether the site 07:55:11

6 generates waste that has that chemical in it, 07:55:16

7 whether there is a release of that chemical, whether 07:55:20

8 that release has impacted groundwater, and whether 07:55:23

9 that groundwater that has been impacted has a 07:55:25

10 possible pathway to reach the plaintiff's property? 07:55:29

11 MR. HAGSTROM: Objection. It's compound, 07:55:32

12 calls for a legal conclusion. It's outside the 07:55:35

13 scope of his opinion. 07:55:38

14 BY MR. GEE:

15 Q You can answer, Mr. Hokkanen. 07:55:40

16 THE WITNESS: I -- I mean I've been 07:55:41

17 involved in some of these in the past, and my role 07:55:46

18 is to look at site data to determine if there were 07:55:53

19 releases and what happened with the releases. 07:55:57

20 BY MR. GEE: 07:56:00

21 Q Okay. And some of these sites -- I won't 07:56:00

22 go into detail because we're running out of time, 07:56:04

23 but some of these sites, you don't even know if VOCs 07:56:06

24 were even used at that site; is that correct? 07:56:13

25 THE REPORTER: I'm sorry. You've given

1 what?

2 MR. GEE: That VOCs were even used at that  
3 site.

4 THE WITNESS: Most of the sites, there's 07:56:19  
5 information that -- that VOCs were used, not all of 07:56:21  
6 them, but most of the sites. 07:56:26

7 The airport, for example, there isn't 07:56:28  
8 information if VOCs were used. There's some 07:56:30  
9 indication that Thatcher Glass may have used VOCs, 07:56:36  
10 the dry-cleaners. 07:56:39

11 BY MR. GEE: 07:56:42

12 Q Okay. Stop your answer, Mr. Hokkanen, just 07:56:42  
13 because we're running out of time. 07:56:46

14 MR. HAGSTROM: Let him -- he gets to -- he 07:56:48  
15 gets to answer the question. You don't get to 07:56:50  
16 interrupt. 07:56:53

17 THE WITNESS: I'm done. 07:56:54

18 MR. GEE: Okay. 07:56:54

19 Q All right. Thatcher Glass, what 07:56:56  
20 indications did you see that they had used VOCs -- I 07:56:58  
21 read their EnviroStor report. I didn't see anything 07:57:04  
22 related to the VOCs usage, disposal, or releases. 07:57:06

23 Is there any -- is there another source of 07:57:10  
24 information that you have -- that you have outside 07:57:12  
25 the EnviroStor that suggests that Thatcher Glass 07:57:14

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1 And so you can't come to the conclusion 07:58:36  
2 based on the documents that I looked at, and it 07:58:39  
3 sounds like you looked at, that VOCs were released 07:58:42  
4 and/or impacted the groundwater. I'm basing that -- 07:58:45  
5 my statement that VOCs were at the site on the EPA 07:58:51  
6 listing. 07:58:55  
7 BY MR. GEE: 07:58:55  
8 Q Okay. And you've done no further 07:58:55  
9 investigation on the Thatcher Glass site; is that 07:59:01  
10 correct? 07:59:04  
11 A That's correct. 07:59:04  
12 Q Okay. Let's talk about Le Val Cleaners. 07:59:05  
13 Was there any other indication that they used VOCs? 07:59:10  
14 A Based on my experience of a dry-cleaner in 07:59:17  
15 the '60s -- and I've worked on quite a few 07:59:19  
16 dry-cleaners -- yes, they used PCE in the late 07:59:23  
17 '60s -- I'm sorry. 07:59:27  
18 Q And what evidence -- go ahead. 07:59:27  
19 A Dry-cleaners in the late '60s in California 07:59:27  
20 used PCE. 07:59:33  
21 Q And what evidence do you have of a release 07:59:34  
22 of PCE at the Le Val cleaners site? 07:59:36  
23 A I don't have specific information about a 07:59:39  
24 release at that specific site. However, again, 07:59:42  
25 based on my and our industry's experience of 07:59:45

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1 dry-cleaners that used PCE in the '60s, the 07:59:49  
2 dry-cleaner machines in the late '60s were hooked up 07:59:53  
3 to sanitary sewer, and I've cleaned up and litigated 07:59:58  
4 a lot of those sites. 08:00:04

5 I don't have specific information, but my 08:00:05  
6 experience is that a dry-cleaner in the '60s 08:00:09  
7 released PCE. 08:00:13

8 Q Okay. And did you report Le Val Cleaners 08:00:14  
9 to the regulatory agencies to tell them that Le Val 08:00:19  
10 Cleaners had PCE releases based on them being in 08:00:23  
11 operation in 1967? 08:00:28

12 A Did I do that? No. 08:00:32

13 Q Did you tell Whittaker to add them as a PRP 08:00:34  
14 because they operated a dry-cleaner in 1967? 08:00:36

15 A No, I did not. 08:00:40

16 Q Okay. Let's go to Glory Cleaners. This 08:00:41  
17 dry-cleaner operated from approximately 1995 to 08:00:55  
18 2014. 08:00:58

19 What evidence did you have that Glory 08:00:58  
20 Cleaners used PCE? 08:01:02

21 A I believe that was in the historian's 08:01:06  
22 report. Hang on. What page are you on, sir? 08:01:11  
23 You're looking at a specific page. 08:01:14

24 Q I'm looking at your -- page 46 of your 08:01:16  
25 expert report. 08:01:19

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1 certain. 08:03:02

2 Q Is it true that the vast majority had 08:03:04

3 switched over before then? 08:03:06

4 A I don't know about this specific 08:03:08

5 dry-cleaner. So I don't know. 08:03:10

6 Q You're basing that on experience. In your 08:03:12

7 experience in 2008, haven't most of the dry-cleaners 08:03:16

8 had switched over from use of PCE? 08:03:20

9 A I'm working on one in San Jose that 08:03:25

10 switched over about eight years ago. So not every 08:03:28

11 dry-cleaner I worked on, no. 08:03:32

12 Q My question is: Didn't the vast majority 08:03:35

13 of dry-cleaners switch off of PCE at that time in 08:03:37

14 2008? 08:03:41

15 A I don't know about the vast majority of 08:03:42

16 dry-cleaners. I'm sorry. I have experience on the 08:03:45

17 ones I've worked on. 08:03:47

18 Q Okay. So basically you don't know if there 08:03:48

19 was a release? You don't even know if that facility 08:03:51

20 used PCE? 08:03:55

21 A Not specifically, no. 08:03:57

22 Q What kind of investigation do you think 08:04:00

23 that Mr. Lechler of CH2M Hill should have done on 08:04:02

24 the Bouquet 2 Cleaners? 08:04:10

25 MR. HAGSTROM: Calls for speculation. 08:04:13

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1 THE WITNESS: What should he have done? 08:04:16

2 BY MR. GEE: 08:04:18

3 Q Yes. 08:04:18

4 A Well, if he wanted to -- 08:04:19

5 Q In your opinion. 08:04:21

6 A Not what should he have done. However, if 08:04:22

7 he wanted to determine if it was a source or not, he 08:04:26

8 could have collected some data at the site. 08:04:29

9 Q You mean do a phase 1 or phase 2 for a site 08:04:32

10 that may not -- may have not used PCE? 08:04:35

11 A Well, I think what he did is because there 08:04:40

12 was no data, he said on any site that they 08:04:42

13 identified. Because there's no data, their 08:04:46

14 conclusion was it's not a source, and I will tell 08:04:49

15 you based on my experience in 40 years of working on 08:04:53

16 sites like this, that's not necessarily an accurate 08:04:56

17 assumption. 08:05:01

18 Q Okay. Mr. Hokkanen, is it your opinion 08:05:02

19 that any dry-cleaner that is in the area without any 08:05:07

20 environmental reports on them should have been 08:05:14

21 thoroughly investigated with borings and groundwater 08:05:17

22 samples to determine whether or not they were a 08:05:22

23 source of PCE? 08:05:25

24 A That's not what I said. 08:05:26

25 Q So what exactly did you expect Mr. Lechler 08:05:27

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1 to do with the Bouquet 2 Cleaners? 08:05:33

2 MR. HAGSTROM: Calls for speculation. 08:05:39

3 MR. GEE: It's his report, Counsel. 08:05:41

4 THE WITNESS: Yeah, I can answer that. I 08:05:44

5 had no specific expectations of Mr. Lechler. What 08:05:45

6 I'm simply pointing out is that there are sites 08:05:49

7 within the capture zones of the production wells 08:05:53

8 that could have been sources. 08:05:56

9 And I think you used the word "potential." 08:05:58

10 I didn't say they were sources. I said they were 08:06:01

11 potential sources. 08:06:03

12 BY MR. GEE: 08:06:05

13 Q Mr. Hokkanen, we talked about capture zones 08:06:05

14 earlier and didn't you say that capture zones would 08:06:09

15 be aquifer specific, meaning that when you talk 08:06:14

16 about the Saugus Formation capture zones, you 08:06:18

17 usually talk about contamination that is in that 08:06:23

18 formation? 08:06:26

19 A Yes. 08:06:27

20 Q Now, a lot of these facilities overlie the 08:06:31

21 alluvial aquifer. 08:06:36

22 Would the capture zone of Saugus-1 and 08:06:38

23 Saugus-2 include the alluvial aquifer? 08:06:42

24 A Indirectly, yes. Not directly. 08:06:50

25 Q Okay. And, Mr. Hokkanen, did you see any 08:06:54

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1 evidence of PCE releases in the alluvial aquifer 08:06:56

2 beneath the Bouquet 2 Cleaner site? 08:07:02

3 A I don't believe there's any data at that 08:07:06

4 particular site. 08:07:08

5 Q Okay. How about at the English Cleaners -- 08:07:09

6 dry-cleaner site, do you know if there's any 08:07:17

7 information about PCE releases to the alluvial 08:07:18

8 aquifer from that site? 08:07:22

9 A I don't believe there's any data for that 08:07:24

10 site either, sir. 08:07:27

11 Q Okay. And so wouldn't have Mr. Lechler 08:07:28

12 have had to have gone through and taken groundwater 08:07:33

13 samples in order to eliminate that site according to 08:07:38

14 your -- according to your opinion that these two 08:07:43

15 sites should have been considered? 08:07:45

16 MR. HAGSTROM: Objection; calls for 08:07:47

17 speculation as to what Mr. Lechler should have done. 08:07:48

18 THE WITNESS: My point is -- is that the 08:07:51

19 absence of data does not mean that the site didn't 08:08:01

20 release contaminants, and in the VOC report, through 08:08:05

21 the process of looking at potential sources, if the 08:08:14

22 site did not have data, it was eliminated. 08:08:17

23 BY MR. GEE:

24 Q Okay. 08:08:19

25 A And my simple point is -- let me finish -- 08:08:20

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1 my simple point is that -- is that I'm not saying 08:08:24  
2 that there were necessarily releases at these sites, 08:08:29  
3 although Flamingo Cleaners is another store, you 08:08:33  
4 haven't gotten to that one yet, I'm not saying that 08:08:37  
5 there were releases. 08:08:45

6 I'm saying given information and given the 08:08:46  
7 history of dry-cleaners and automotive, there could 08:08:48  
8 have been. They're potential sources. 08:08:53

9 Q Okay. And as I indicated, Mr. Shoup got 08:08:56  
10 some of this information from phone books. 08:09:03

11 Is that -- is that a source of 08:09:04  
12 environmental -- is that a source where you would 08:09:06  
13 look for environmental releases? 08:09:10

14 A Phone directories are a standard phase 1 08:09:19  
15 ASTM practice, identifying through phone 08:09:23  
16 directories, different facilities that could have 08:09:26  
17 had releases is a standard practice in my industry. 08:09:30

18 Q Okay. And based on the information that 08:09:33  
19 you present here, as a professional advising 08:09:37  
20 Whittaker, would you have suggested to Whittaker to 08:09:42  
21 list any of these potential sources as third-party 08:09:48  
22 defendants in this litigation? 08:09:55

23 MR. HAGSTROM: Objection; calls for 08:09:57  
24 speculation, outside -- way outside the scope of his 08:09:59  
25 expert report. 08:10:04

1 MR. GEE: I'm not talking about his expert 08:10:04  
2 report. I'm asking him as a professional, sir. 08:10:08  
3 Q Mr. Hokkanen, you can answer. 08:10:10  
4 A I can answer that. Again, in 40 years of 08:10:12  
5 practice, I've never recommended any legal action as 08:10:16  
6 you're suggesting. I identify information and the 08:10:21  
7 attorneys that I work with can do whatever they want 08:10:25  
8 with it. 08:10:28  
9 BY MR. GEE: 08:10:29  
10 Q Okay. And in your evaluation, did you -- 08:10:29  
11 do you evaluate the sites as likely -- or as 08:10:34  
12 unlikely sites, possible sites, and likely sites of 08:10:38  
13 contamination? 08:10:43  
14 A I mean it's the way you described it. I 08:10:43  
15 mean that would be the way to do it, yes, and 08:10:50  
16 dry-cleaners are typically at the top of my list. 08:10:54  
17 Q Okay. Based on the information that you've 08:10:57  
18 gleaned from these dry cleaners, would they be -- 08:11:00  
19 would they be in the likely, highly likely, or what 08:11:03  
20 category would you put these specific dry-cleaners 08:11:07  
21 in? 08:11:12  
22 A They vary. Depends, as you indicated 08:11:12  
23 earlier, on what -- sort of what era they operated 08:11:16  
24 in, is there any information that I can use to put 08:11:21  
25 them in a category. 08:11:24

1 For example, Flamingo Cleaners has no 08:11:26  
2 releases. There is a plume of PCE moving to the 08:11:31  
3 southwest from that site. 08:11:36

4 Le Val Cleaners operated in the late '60s. 08:11:37  
5 Based on my experience and the experience in the 08:11:40  
6 industry, there's a high likelihood that there were 08:11:43  
7 releases. Some of these other sites that you talked 08:11:47  
8 about, they would be medium -- medium or low 08:11:49  
9 category depending on what years they operated. 08:11:54

10 The more recent years of operation, much 08:11:58  
11 lower chance of PCE use and PCE releases. The 08:12:02  
12 further back you go, the higher probability. 08:12:06

13 Q Okay. Outside of looking at Mr. Shoup's 08:12:09  
14 expert opinion, what further investigation did you 08:12:13  
15 do on these sites? 08:12:17

16 A Did I do on these sites? 08:12:18

17 Q That's what I'm asking, yes. 08:12:20

18 A I didn't do any investigation on any of 08:12:22  
19 these sites. I did look at documents related to 08:12:25  
20 Flamingo Cleaners, but no, you know, field 08:12:28  
21 investigation if that's what you're asking. 08:12:32

22 Q So other than Mr. Shoup's expert report, is 08:12:33  
23 it correct to say that you did no further 08:12:39  
24 investigation as to the viability of the sites as 08:12:42  
25 potentially responsible parties? 08:12:46

1           A       Well, I'll answer it this way. I did not       08:12:52  
2       do -- other than the review of documents for       08:12:55  
3       Flamingo Cleaners, I did not do any investigation at       08:12:59  
4       these sites, that's correct.       08:13:02  
5           Q       Okay. Let's move on to your -- I may come       08:13:03  
6       back to this, but we're running out of time. So I       08:13:08  
7       do want to cover opinion number nine.       08:13:12  
8           MR. HAGSTROM: How much time -- and you can       08:13:14  
9       have this 30 seconds -- how much time is left, Court       08:13:16  
10       Reporter?       08:13:17  
11           MR. GEE: Let's go off the record to get       08:13:18  
12       the time.       08:13:19  
13           THE VIDEOGRAPHER: Four -- four minutes.       08:13:20  
14           MR. HAGSTROM: Did you say four minutes?       08:13:24  
15           THE VIDEOGRAPHER: I said four. Would you       08:13:27  
16       like to go off the record?       08:13:29  
17           MR. HAGSTROM: Yes.       08:13:30  
18           THE VIDEOGRAPHER: Okay. We're going off       08:13:31  
19       the record at 8:13.       08:13:33  
20       (Discussion held off the record.)       08:14:22  
21           THE VIDEOGRAPHER: We are back on the       08:14:27  
22       record. The time is 8:14. Please proceed.       08:14:29  
23       BY MR. GEE:  
24           Q       Mr. Hokkanen, have you ever designed a       08:14:31  
25       water distribution system in your experience?       08:14:33

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1	A	Designed one, no.	08:14:37
2	Q	Have you ever operated a water distribution	08:14:38
3		system in -- in your experience?	08:14:45
4	A	No.	08:14:45
5	Q	Are you aware that the pressure within a	08:14:46
6		water distribution system is approximately 150 to	08:14:50
7		175 pounds per square inch?	08:14:55
8	A	I actually -- as I think Mr. Sinclair went	08:14:59
9		briefly through my background, I have a civil	08:15:02
10		engineering degree, and I studied water and	08:15:05
11		wastewater and distribution systems and this sort of	08:15:09
12		thing. So, yes, I do know that these pipes are	08:15:12
13		pressurized.	08:15:15
14	Q	Okay. And the sites that you -- that you	08:15:16
15		referenced that may be contributing to the PCE	08:15:20
16		contamination such as dry-cleaners, do they have any	08:15:26
17		facilities -- or any tanks or pipes or anything at a	08:15:29
18		dry-cleaners that can produce 150 to 175 pounds per	08:15:33
19		pressure?	08:15:39
20	A	I don't believe so, no.	08:15:39
21	Q	So did you do a fate and transport analysis	08:15:41
22		to determine whether a dry-cleaner can put TCE	08:15:47
23		contamination in 150- to 175-pound distribution	08:15:52
24		system?	08:15:55
25	A	Did I do an analysis like that, no.	08:15:55

1 Q And how did you conclude that these other 08:15:57  
2 potential sources of PCE could contaminate the 08:16:02  
3 distribution system? 08:16:10  
4 A I believe Mr. Leserman testified that he 08:16:10  
5 felt that one of the dry-cleaners, Flamingo 08:16:16  
6 Cleaners, could have been the source of the high PCE 08:16:19  
7 detections at one of the turnouts. 08:16:22  
8 Q So you're admitting that the agency did do 08:16:24  
9 an investigation of the Flamingo Cleaners; is that 08:16:28  
10 correct? 08:16:30  
11 A I believe I read a report that they looked 08:16:30  
12 at potential sources for the high PCE detections at 08:16:35  
13 the turnout, yes. 08:16:40  
14 Q Okay. And did you read Mr. Leserman's 08:16:41  
15 report? 08:16:46  
16 A I think I did, yes, once. It wasn't a very 08:16:47  
17 long report, if I remember right. 08:16:49  
18 Q Okay. And did -- did he conclude that the 08:16:52  
19 PCE may have gotten into the system during a 08:16:55  
20 distribution system shutdown and startup? 08:16:59  
21 A I believe he mentioned something like that, 08:17:04  
22 but I don't think he said he definitively knew that 08:17:06  
23 was the source. 08:17:09  
24 Q Okay. And in your experience as a civil 08:17:10  
25 engineer, when you're starting up a pipeline, is 08:17:13

1           there -- or any kind of pipe, is there a possibility           08:17:16

2           that a capillary can be formed that would actually           08:17:18

3           suck material in during the startup of operation           08:17:23

4           when the operation is not very stable?           08:17:26

5           A       I don't know their system that well. I've           08:17:29

6           tried to get information to understand their           08:17:35

7           distribution system better, but as you start up, you           08:17:38

8           will create a pressure, yes.           08:17:43

9           Q       Okay. And was that Mr. Leserman -- part of           08:17:44

10          Mr. Leserman's analysis for bringing in low pressure           08:17:48

11          PCE into the distribution system, if you recall?           08:17:56

12          A       I don't remember that part of the -- no, I           08:18:01

13          don't remember that. I apologize.           08:18:03

14          Q       Okay. And how else can PCE get into a           08:18:04

15          pressurized distribution system?           08:18:10

16          A       I'm not sure.           08:18:13

17                   THE VIDEOGRAPHER: So we are now at eight           08:18:17

18          hours.           08:18:20

19                   MR. HAGSTROM: You mean nine hours,           08:18:22

20          correct?           08:18:24

21                   THE VIDEOGRAPHER: Excuse me. Nine hours,           08:18:25

22          yes. Sorry. I'm tired, too. Sorry. Yes, nine           08:18:28

23          hours.           08:18:32

24                   MR. SINCLAIR: Don't encourage them.           08:18:34

25                   MR. GEE: I only have one more opinion           08:18:36

1 left. 08:18:39

2 THE VIDEOGRAPHER: Yes, it is nine hours. 08:18:39

3 Thank you. 08:18:41

4 MR. GEE: Before we go off the record, can 08:18:43

5 I make a statement akin to an objection? 08:18:47

6 Just for the record, Mr. Hokkanen's expert 08:18:52

7 report, we spent a lot of time on that expert 08:18:55

8 report, contained nine separate opinions, and nine 08:19:01

9 separate opinions do take a lot of time to go 08:19:06

10 through. 08:19:09

11 Mr. Hokkanen did do a lot of thinking 08:19:09

12 through, you know, like, his opinions and to obtain 08:19:13

13 the basis of his opinions and to get full testimony 08:19:19

14 as to what he considered in his opinions, I believe 08:19:23

15 it would take more than nine hours. 08:19:28

16 I think that we could easily use another 08:19:31

17 extra two hours, and we've had a brief discussion 08:19:35

18 with Whittaker counsel and Whittaker counsel 08:19:41

19 disagrees and is not willing to extend the 08:19:43

20 deposition for any period of time. 08:19:50

21 Is that correct, Mr. Hagstrom? 08:19:52

22 MR. HAGSTROM: The judge said nine hours. 08:19:54

23 We are going with the court's order. 08:19:57

24 MR. GEE: Okay. It is correct that you're 08:20:01

25 not agreeing to any type of extension? 08:20:04

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1 MR. HAGSTROM: The court said nine hours. 08:20:07

2 We're going with the court's order. I've answered 08:20:09

3 your question. 08:20:13

4 MR. GEE: Okay. Just so long as it's on 08:20:13

5 the record. 08:20:15

6 Mr. Murray, did you have any further 08:20:16

7 questions that you wanted to ask Mr. Hokkanen and we 08:20:18

8 ran out of time? 08:20:22

9 MR. SINCLAIR: You're asking me? 08:20:24

10 MR. GEE: Yes. 08:20:27

11 MR. SINCLAIR: Yeah, I think I was 08:20:29

12 basically done -- 08:20:34

13 MR. GEE: Okay. 08:20:35

14 MR. SINCLAIR: -- to be honest. 08:20:36

15 MR. GEE: All right. 08:20:37

16 MR. HAGSTROM: Thank you, everybody. 08:20:39

17 Linda, hats off to you and, Madam 08:20:41

18 Videographer. 08:20:46

19 THE VIDEOGRAPHER: If everyone would stand 08:20:47

20 by just a moment, and I'll take us off the record. 08:20:50

21 This concludes today's testimony given by 08:20:53

22 Gary Hokkanen. The total number of media units used 08:20:57

23 was six. All media will be retained by Veritext on 08:21:01

24 a local secured drive and redundantly stored in the 08:21:05

25 Veritext-managed Amazon MP3 cloud services for 08:21:06

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1 preservation purposes. 08:21:09

2 We're going off the record at 8:21. 08:21:10

3 THE REPORTER: Mr. Sinclair, do you want a 08:21:14

4 copy? 08:21:17

5 MR. SINCLAIR: Not right now. 08:21:17

6 MR. HAGSTROM: And, Linda, we would like 08:21:24

7 rough. 08:21:26

8 THE REPORTER: I figured as much. 08:21:27

9 MR. HAGSTROM: Yeah, okay. Thank you. 08:21:29

10 MR. GEE: You know, I want a rough, too. 08:21:29

11 THE REPORTER: I figured as much. 08:21:34

12 (Whereupon, at the hour of 8:21 p.m.,

13 the deposition was concluded.)

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1 STATE OF CALIFORNIA )  
2 ) ss  
3 COUNTY OF ORANGE )  
4

5 I, GARY HOKKANEN, declare under the  
6 penalties of perjury of the laws of the United  
7 States that the foregoing is true and correct.

8 Executed this day of ,  
9 2020, at , California.

10  
11  
12  
13 -----  
14 GARY HOKKANEN  
15  
16  
17  
18  
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23  
24  
25

1 STATE OF CALIFORNIA )

2 ) ss

3 COUNTY OF ORANGE )

4 I, LINDA NICKERSON, CSR #8746, in and for  
5 the State of California do hereby certify:

6 That, prior to being examined, the witness  
7 named in the foregoing deposition was by me duly  
8 sworn to testify the truth, the whole truth, and  
9 nothing but the truth;

10 That said deposition was taken down by me in  
11 shorthand at the time and place therein named, and  
12 thereafter reduced to typewritten form at my  
13 direction, and the same is a true, correct, and  
14 complete transcript of the testimony at said  
15 proceedings.

16 Before completion of the deposition, review  
17 of transcript [X] was [ ] was not requested. If  
18 requested, any changes made by the deponent (and  
19 provided to the reporter) during the period allowed  
20 are appended hereto.

21 I further certify that I am not interested  
22 in the event of the action.

23 WITNESS MY HAND this 7th day of October, 2020.

24 

25 LINDA NICKERSON, CSR No. 8746

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## [couple - daus]

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**[direction - dramatic]**

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**[dramatic - elevation]**

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

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COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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